Contractors and Engineers

magazine of modern construction

MAY 1954

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A Pioneer Model 39-V crushing and screening plant works near the refinery being built for Standard Oil Co. near Mandan, N. Dak. Powered by a Caterpillar D13000 diesel engine, the plant produces gravel for tank bases, roadways, and bituminous surfacing. Page 62.

Laying the hot-mix Texaco Asphaltic Concrete wearing surface, final step in this New York State highway project. Prime contractor—Tuckahoe Construction Co., Tuckahoe, N. Y.; Asphalt contractor—County Asphalt, Inc., Tarrytown, N. Y.

New York made this an all flexible highway

Applying an 85/100 penetration Texaco asphalt to the top 4 inches of the 12-inch broken stone base.

A section of the new 22-foot pavement, which will have a 10-foot shoulder on each side when completed.

West of Liberty, N. Y., State Route 52 serves one of New York State's most popular resort areas. Last year, when the Department of Public Works built a new 7-mile link in this highway, it employed flexible construction from top to bottom.

For the sub-base, run-of-bank gravel was laid in two lifts to a compacted thickness of 12 inches. This was covered by three 4-inch courses of broken stone, the top course penetrated by an application of two gallons of 85/100 penetration Texaco asphalt per square yard. A two-course hot-mix Texaco Asphaltic Concrete pavement, with a combined thickness of 3 inches, completed the highway.

The all-flexible type of construction used on New York's Route 52 merits serious consideration for all toll roads, important highways and other heavily traveled thoroughfares. It is capable of absorbing punishing impact for years with a minimum of maintenance. Its first cost and upkeep cost are lower than for comparable pavements. Its easy-riding, skid-resistant qualities, as well as its freedom from glare and absence of joints all contribute to maximum driving comfort and safety.

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Contractors and Engineers
magazine of modern construction

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EDITORIAL

Afterthoughts on Conventions

Probably every reader of this magazine had a direct or indirect interest in one or more of the conventions held this past winter by groups with a stake in the construction industry. Meeting at both national and regional levels, engineers, contractors, manufacturers, distributors, and suppliers heard about new techniques or new ideas. Government spokesmen—federal, state, or local—offered their opinions as to what effect administration policies may have on the future of the industry.

An innovation, introduced at the March convention of the Associated General Contractors of America in Los Angeles, may start a new trend.

One of the key speakers on the AGC program was U. S. Secretary of Labor James P. Mitchell. As a Cabinet meeting in Washington prevented the Labor Secretary from making the trip to the west coast, his speech was filmed and shown to the assembled contractors in the Hotel Statler ballroom. The talk was received as enthusiastically as if Secretary Mitchell were there in person. Actually, the close-ups of Secretary Mitchell gave the large group a better "look" at the Secretary than if he were present on the podium. And the speech seemed shorter, and more to the point, than the usual convention address.

Here, perhaps, is a technique that conventions might use to acquire big-name speakers who cannot spare the time to attend the meeting in person. If a busy executive or public official has his talk filmed and forwarded speedily to the convention city, the gathering can be assured of top-flight talent for its program without too much expense.

But the "canned" speech, if used too often, might well backfire and leave the audience unreceptive and cold. One of the inducements to attending a convention has been the promise of hearing, and maybe meeting, acknowledged leaders or well-known experts in a particular field.

Taking a further look at various conventions and their usefulness, one of the better balanced gatherings in the construction industry was the regional meeting of the Association of Highway Officials of North Atlantic States. This year, these highway chiefs met at a Washington hotel and presented the usual assortment of technical papers. And, as has been the custom, space in the hotel was consigned to equipment manufacturers and some materials suppliers so they could show their products or distribute literature. As always, the display booths were well visited whenever convention delegates were not busy attending meeting sessions. Thus the highway officials got first-hand information on new developments in tools and materials used in road construction and maintenance work.

This opportunity to meet personally the manufacturers' representatives and get direct advice from these experts is an asset to any convention. The exhibits were conducted with good taste and an absence of commercialism. Since big expensive showings of construction equipment and materials are necessarily few and far between, small-scale economical displays as were seen at the AHONAS convention could be held by other groups to the benefit of the convention-goer.

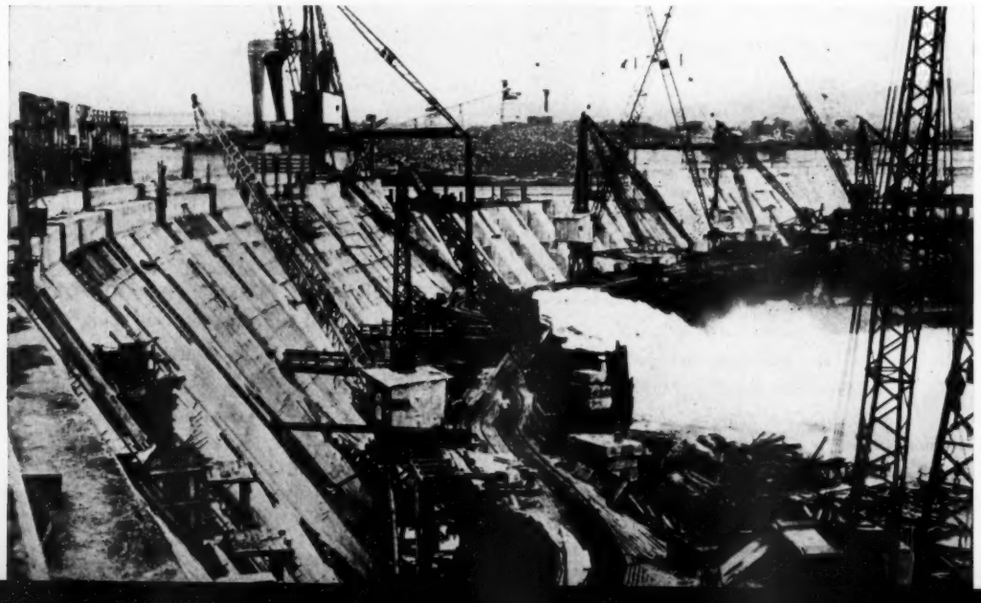
NEWS AND VIEWS

All the statistics, surveys, and reports charting our economy are recording an obvious fact. We're in good shape. No matter what yardstick is used by public or private bodies, their statements agree that construction **activity and awards are growing** past expectations.

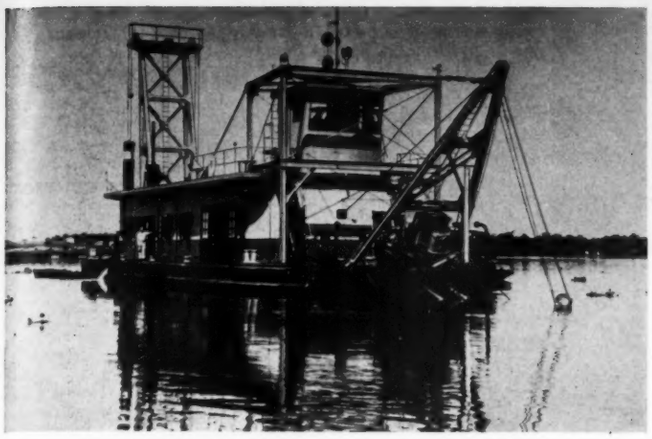
Expenditures through March — $2.5 billion — brought construction work in the **first quarter to a record figure of $7.3 billion,** or $125 million more than the all-time high last year, according to Department of Labor and Commerce figures. At this rate, 1954 construction is heading toward a $36.1 billion total to outstrip previous government calculations by about $2 billion.

Contract awards, down at the start of the year, show evidence of beginning to rival last year's top record. The upturn which began in February continued through March and **gained even more ground this past month.** Further increases should be more evident in coming weeks when the $25-million Delaware River Bridge goes under contract and Florida lets work for its $87-million turnpike.

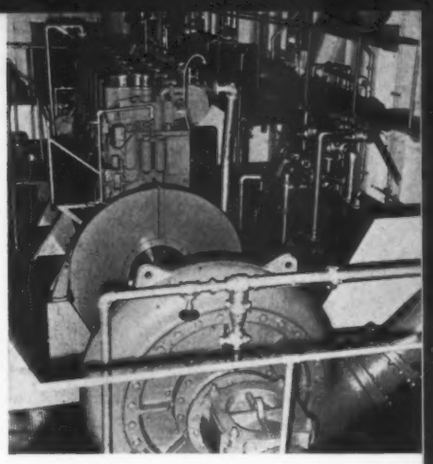
With turnpike work growing in importance, formation of a **National Turnpike Association** comes as no surprise. One of the first jobs facing the non-profit organization is to clear itself of charges that it has been soliciting donations from highway contractors.



Shown here under construction, Owen Falls Dam on the White Nile went into operation April 29 as Queen Elizabeth pressed a button to open its six control sluices. When completed, the dam will have a 150,000-kw capacity and make Lake Victoria the largest reservoir in the world.



This Ellicott 16-inch hydraulic pipe line dredge is being used by the Colombian Ministry of Works to straighten and deepen the centuries-old Dique Canal at the western edge of Colombia. It has an hourly pumping capacity of 225 cubic yards.



A view of the engine and pump room, looking aft, of the dredge being used to remodel the Dique Canal. The pump (foreground) takes in dredged matter and discharges it through the pipe leading off at right. Diesel power equipment is at the rear.

Centuries-Old Canal Being Reconstructed

One of the oldest engineering works in the Western Hemisphere—the 300-year-old Dique Canal in the Republic of Colombia—is currently being straightened and deepened by the Colombian Ministry of Public Works. The dredging program is designed to shorten the canal slightly, straighten 20 curves along its length, and eliminate flood hazards.

The canal, which runs between Cartagena on the Pacific Ocean and the port city of Calamar on the Magdalena River, will be 71 miles long and have an average minimum depth of 8 feet when work is completed. It will allow both passenger and cargo ships to serve Cartagena, Calamar, and a dozen other towns.

Swampy shallow stretches here and there have limited use of the canal to small flat-bottom boats. The planned improvements will provide a long-needed commercial link with the Magdalena River, a vital traffic artery.

An Ellicott 16-inch hydraulic pipeline dredge is being used on the job. The machine was shipped knocked-down from Baltimore, Md., and assembled near the project site. The Ministry of Public Works has placed the dredge at the disposal of the canal maintenance board for use on the waterway.

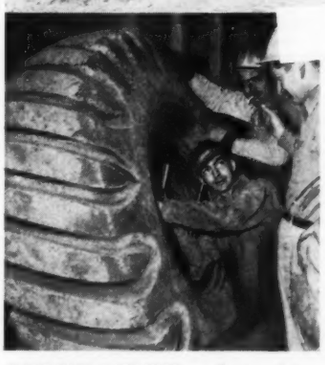
The ladder of the dredge permits working to a depth of 26 feet, and the pump can handle 225 cubic yards of solids hourly through pipelines up to 1,600 feet in length and with a terminal elevation of 6 feet. Machinery is protected by a steel house, and a lever room located at the bow provides centralized controls for the operator.

The dredge pump is driven by a 600-hp Enterprise diesel, Model DSG-36. Power for the cutter is supplied by an enclosed electric motor through suitable reduction gears, and the hauling and hoisting machinery is also electrically operated. Electric power is supplied by a 175-kw generator, which is driven by a second Enterprise diesel, Model DSH-18.

Originally conceived in 1571 and built by local labor under a grant from King Philip IV of Spain, the Dique Canal has been in use with but few interruptions since 1650. When the present project is completed, the waterway will provide greatly enlarged shipping facilities.

THE END

The 13,800,000-cubic-yard Palisade Dam on Snake River, Idaho, will be one of the world's largest earth-fill barriers—260 feet high, 2,200 feet long by 40 feet wide at the crest, and 2,250 feet wide at the base. Wrenching the treacherous Snake River from its bed to a man-made channel (with 60 miles of momentum behind the river) was just one of the problems this job dishes out regularly!



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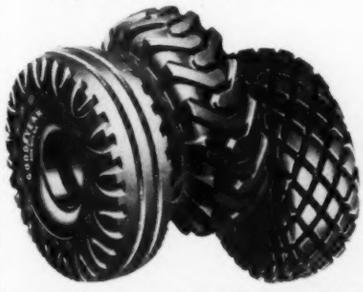

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3-T Cord—both Nylon and Rayon—is made by Goodyear's exclusive Triple-Tempering process. It *stays* at its most bruise-resistant, heat-resistant point, controls tire growth, cuts tread and body failures to new lows. Get *all* the facts before you buy or specify any other tire. Goodyear, Truck Tire Dept., Akron 16, Ohio.

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An Athey loader picks up gravel from the widened section of the road and loads it into trucks. The gravel is then stockpiled for later use in surface treating the shoulders. *C&E Staff Photos*

Shoulders, built up with 3-inch bituminous courses, add 7 feet to width of 4-lane road in Maryland

Old Divided Highway Widened and Surfaced

Bergen Wire Rope Company has been supplying wire rope to meet the most exacting requirements of the Army, Navy, Air Force and of industry for many years. Bergen's modern plant is fully equipped with the latest types of machinery for swaging, pressing, welding, tensile testing, proof testing, pre-stressing and laboratory developmental work.

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IF PRESENT PLANS are carried out, the Maryland State Roads Commission will build about 300 miles of new roads and modernize about 3,100 miles of existing roads within the next 12 years. Modernizing old roads, by far the commission's most important job, includes widening, resurfacing, realigning, regrading, and any other work required to make a road adequate for present-day traffic conditions.

Sometimes even 4-lane divided highways need modernizing. State Route 2 between Baltimore and Annapolis, for example, is a divided highway having reinforced-concrete lanes that are too old and too narrow for today's traffic.

Contracts Awarded

Accordingly, the State Roads Commission has awarded three contracts calling for the bituminous concrete widening and resurfacing of about 14½ miles of the heavily traveled route. Two of the contracts went to the Bituminous Construction Co., Baltimore, and the third to A. H. Smith of Branchville, Md. The total cost will be more than $1,000,000.

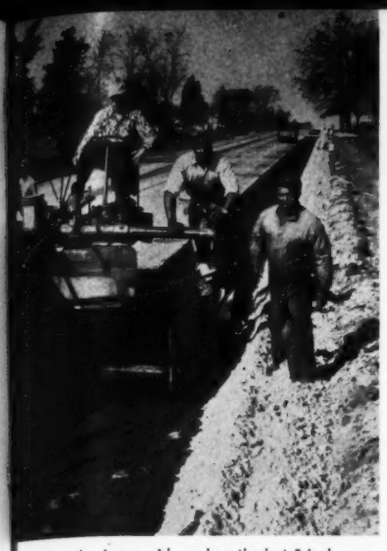
The plans call for widening the existing 20-foot-wide southbound lane 4½ feet along the median side, and surfacing to a 24-foot width. The existing 22-foot-wide northbound lane is being widened 2½ feet and surfaced to 24 feet. Also, the existing bituminous-treated gravel shoulders will be scarified, surfaced with gravel, and treated with calcium chloride.

The Bituminous Construction Co.'s second contract, totaling $338,000, called for completion of about 5 miles of widening by the end of 1953, and surfacing by the spring of 1954.

Equipment Spread

Practically all of the widening work was done with an equipment spread consisting of a Caterpillar No. 12 grader, an Athey loader, an Apsco widener, and a Huber roller.

The sequence of operations began with the grader. Using a drop-blade attachment, it moved a 3-foot strip of sod and topsoil away from the edge of the existing 2½-foot-wide bituminous-treated gravel shoulder. Next, the blade was shifted, and the grader windrowed the gravel shoulder material along the edge of the concrete pavement. The windrowed



An Apsco widener lays the last 3-inch course of bituminous concrete to bring the widened section up to the grade of the old pavement.

material was then picked up with the Athey loader, dumped into trucks, and stockpiled for later use on the outside shoulders.

The grader followed with a third pass, this time using the full 9-inch depth of the drop-blade to box out all remaining material. In most cases, the grade was so nearly perfect that only one man was required to follow up.

Working usually about ½ mile behind the grader, the Apsco widener laid three 3-inch courses of bituminous concrete to bring the widened section up to the level of the concrete pavement. Each course was rolled by a Huber 10-ton tandem roller.

This spring the full 24-foot width was to be surfaced with two courses of bituminous concrete. Topsoil and sod were to be replaced and all excess material wasted.

Operations on the median side of the northbound lane are similar, except that a 2½-foot widening is required.

With bituminous concrete available in a continuous flow, this type of equipment spread can widen up to 2,500 feet per 10-hour day.

Personnel

R. Stringer is superintendent for Bituminous Construction Co. William F. Childs, Jr., is chief engineer of the Maryland State Roads Commission. THE END

Build Moving Sidewalk

The world's first commercial moving sidewalk, capable of carrying 10,400 passengers an hour, will soon be in operation through a tunnel connecting the stations of the Erie Railroad and the Hudson & Manhattan Railroad in Jersey City, N. J. The 227-foot conveyor is being built for the Hudson & Manhattan by the Goodyear Tire & Rubber Co., Akron, Ohio, and the Stephens-Adamson Mfg. Co., Aurora, Ill.

General Electric Co. engineers developed the electrical system for the conveyor, known as a Speedwalk. A six-ply rubber and fabric belt, 5½ feet wide and ⅝ inch thick, travels 1½ miles per hour in operation of the carrier.

Equipment includes a fan-cooled motor, a combination reversing starter, and a thrustor brake.

Pa. Turnpike Will Use Electronic Toll System

The Pennsylvania Turnpike is the latest toll road to adopt a new collection and audit system utilizing photoelectric eyes, specially designed weighing platforms, and toll recorders. The system, developed by International Business Machines Corp., is expected to be in operation on all terminals and interchanges of the 360-mile road by the fall of next year.

The system includes an electronic unit which will take care of the turnpike's bookkeeping and compile traffic density data showing which interchanges are in heavy use. Other electronic devices will count the number of axles on each vehicle as well as weigh each vehicle as it approaches a toll-collection booth.

The new system, which will require no change in driving procedures currently used by motorists, will assure greater control over toll collection, auditing, and accounting.

So. Pacific Milling Names New Executive

Milton F. Masters, specialist in highway construction engineering, has been appointed executive assistant to the president of Southern Pacific Milling Co., Santa Barbara, Calif., according to an announcement by Jake Will, firm president.

Mr. Masters will supervise all branch operations of the company, which produces a variety of aggregates and allied building materials.

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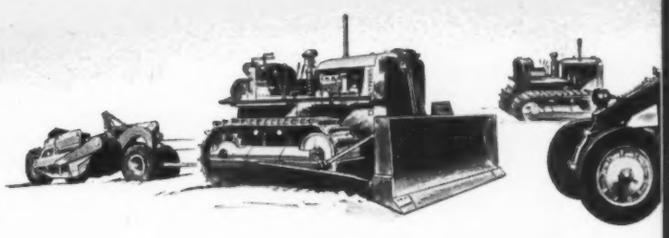

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Concrete dam and power plant will form the fifth link in company's chain of facilities on the Housatonic River

Shepaug Dam Will Provide More Power for Industry

A NEW hydroelectric development rising on the hard-working Housatonic River is a part of Connecticut Light & Power Co.'s answer to industry's call for more and more power. The company, which now has four hydro plants on the river and its tributaries, will derive a total of about 98,000 kw in rated capacity from the 25-mile stretch of water between Stevenson and New Milford when Shepaug Dam is completed in the fall of 1955.

The $10,000,000 project near Sandy Hook, Conn., is being built by United Engineers & Constructors, Inc., Philadelphia, Pa. Charles T. Main, Inc., Boston, Mass., is the engineer. The dam is the mass-concrete gravity-section type, requiring approximately 210,000 cubic yards of concrete. It will be 1,412 feet long, 139 feet high, and will impound a long narrow lake covering 1,870 acres. The 293-foot spillway will have five 35 x 28-foot tainter gates and two 35 x 23-foot stanchion gates.

There are 32 monoliths. Excepting the penstock intake unit which is 70 feet wide, each monolith is 43 feet in width. The 25-foot-diameter penstock will carry water to the 106 x 74-foot powerhouse, where a Kaplan adjustable blade-type turbine will drive a generator with a rated output of 37,250 kw.

The dam will actually run from north to south, since it is located at a bend in the river about 2½ miles upstream from the bridge carrying U. S. 6 into Southbury.

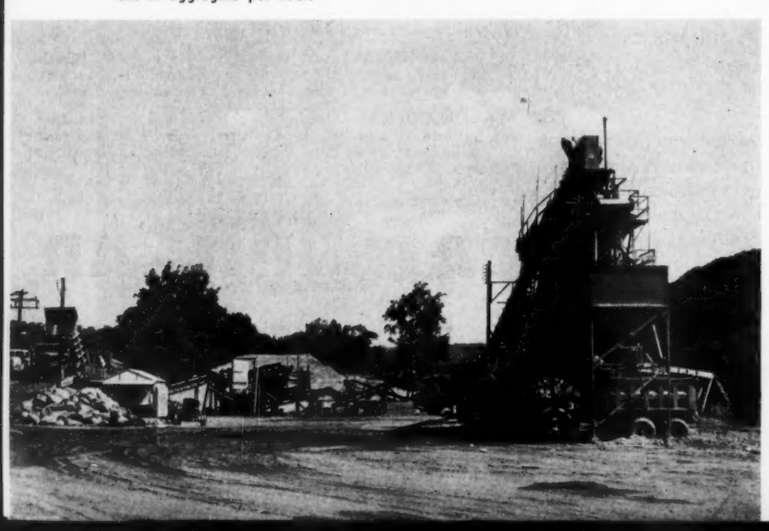
United Engineers & Constructors moved in early in March, 1953, and immediately set dozers and chain-saw crews working to clear the 10-acre area around the dam site. Shovels and trucks followed to excavate about 300,000 cubic yards of overburden from the north bank. Manitowoc draglines and Lorain and Koehring shovels, working with fleets of rented dump trucks, moved most of the earth from the bank to a large plain on the north side of the river just downstream from the dam site. Here the fill was leveled and compacted and the area used as a yard for the contractor's offices, shops, and aggregate plants.

Stream Diversion

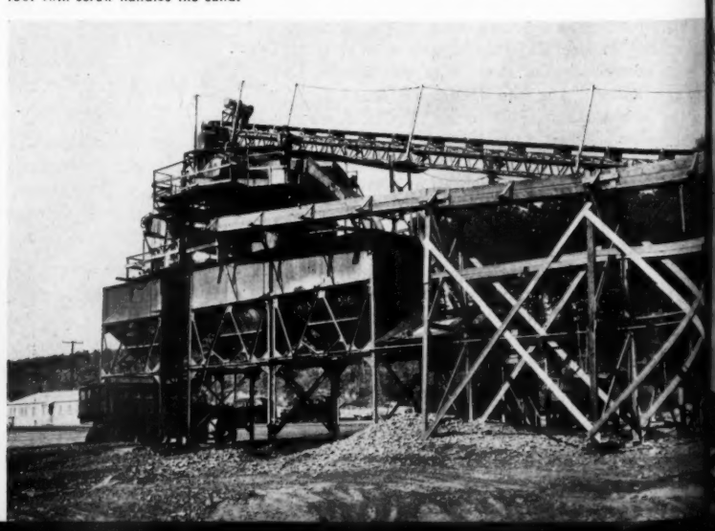
Because of the rolling topography of the area, a two-stage construction plan is being followed which calls for first diverting the river around a combination sheet-pile and earth cofferdam on the north side of the river. To begin the cofferdam, a Manitowoc 3500 dragline was brought in to cast up riverbed material into a berm. Then 48-foot-long steel sheets were driven along the toe of the berm on the river side. The 16-inch-wide sheets were first set in a timber frame and then driven about 15 feet into the ground with a McKiernan-Terry 9B3 hammer. Air for the hammer was supplied by two Ingersoll-Rand 600-cfm portable compressors. About 800 sheets were driven around the berm, providing a 1,100-foot-long cofferdam. After all the sheets had been driven the Manitowoc used more riverbed material to backfill along both faces of the sheet wall.

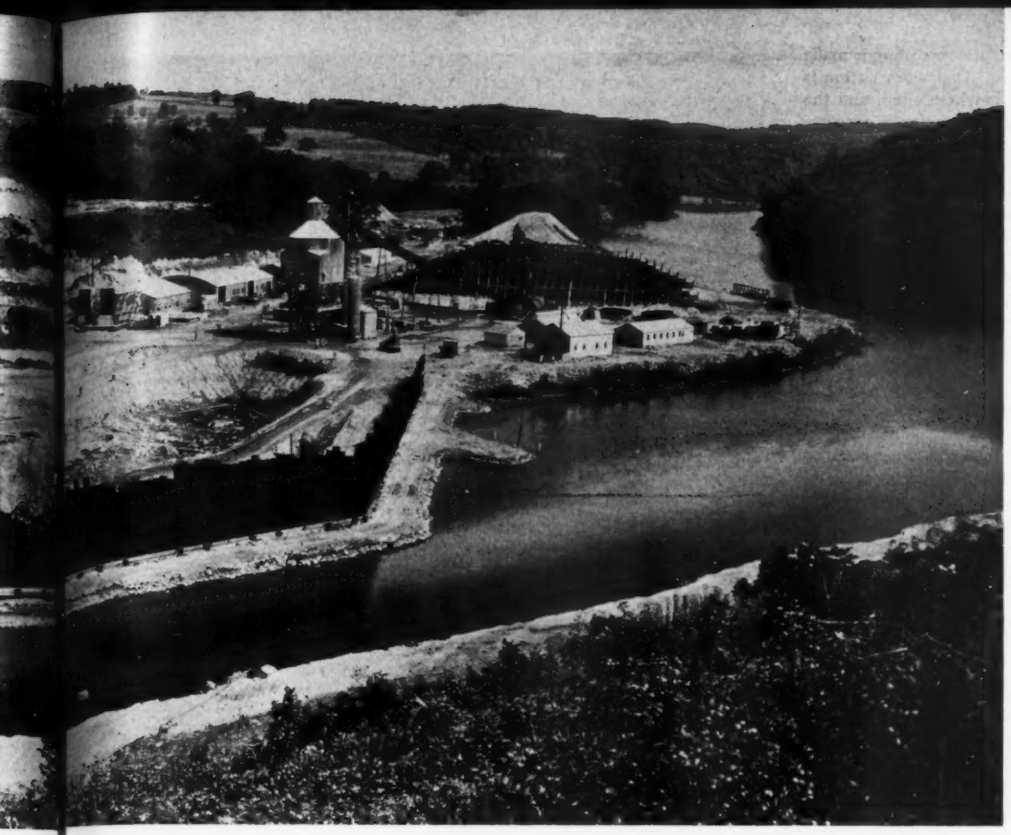
To provide protection against seepage, especially during the spring

This Pioneer crushing, screening, and washing plant used on the project consists of a 150 P6 primary crushing unit with 20 x 36 jaw crusher, a 140-S secondary crushing unit with 40 x 22 crusher, and a 405-W electric-powered washing plant. Its average production is about 100 tons of aggregate per hour.



A close-up view of the Pioneer 405-W washing plant. Here gravel hauled from the riverbed upstream is washed, graded, and then dropped according to size into three bins at the left. A 40 x 20-foot tandem vibrating screen separates the coarse aggregates, while a 22-inch x 22-foot twin screw handles the sand.





This view of the Shepaug Dam project shows how the water was diverted around a sheet-pile cofferdam during construction on the left bank of the river. A concrete pour is under way at left. Right: contractor's yard with Johnson batch plant.
C&E Staff Photos

A Lorain dragline working upstream from the dam site excavates riverbed gravel and loads it into trucks. The material is then hauled to the crushing plant for processing into aggregate.

By ALBERT C. SMITH, Field Editor

flood season, the contractor circled the inside of the berm with a Moretrench wellpoint system. About 1,200 feet of 12-inch header pipe services the 70 points. Two pumps are kept operating continuously.

While the cofferdam was being built, shovels and draglines were already removing the overburden along the axis of the dam. When bedrock was reached, final cleaning was done with water jets. Because of its rough surface, little work was required to prepare the bedrock foundation. Rock blasting was required only for the draft tube and tailrace channel.

Aggregate Production

Meanwhile, more crews were arriving on the job to set up the huge plants and stockpile the aggregates. Thus far, all of the aggregates have been acquired from riverbed material excavated upstream from the

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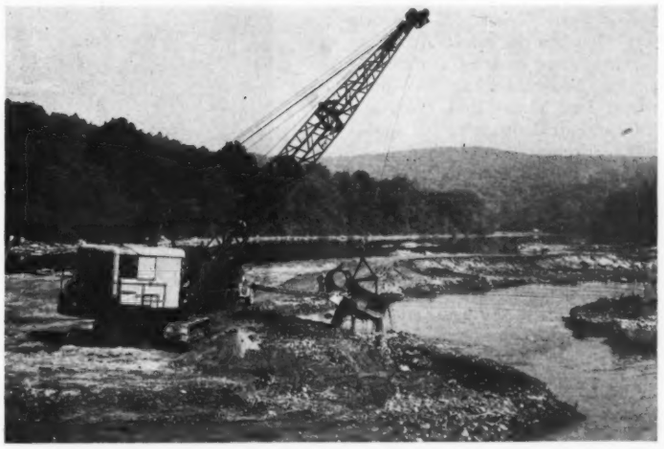
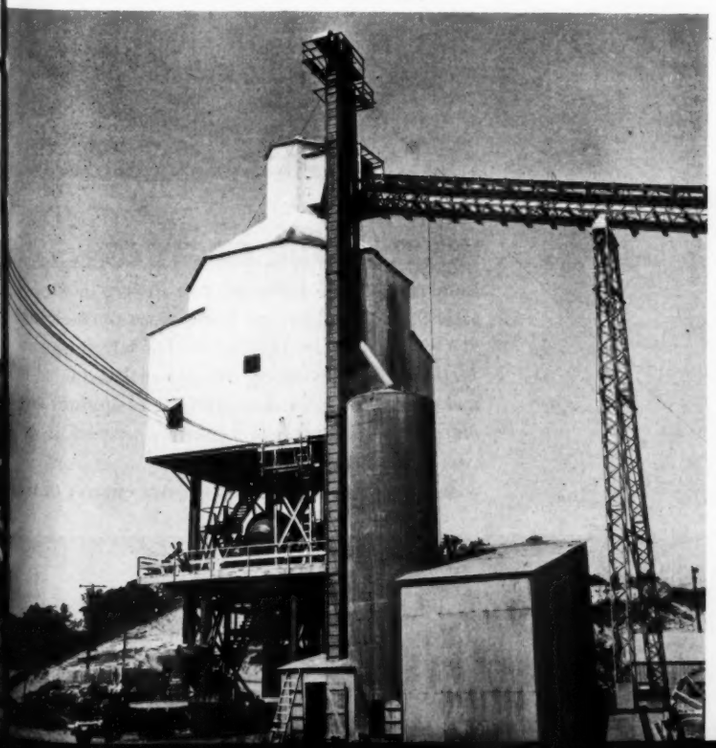
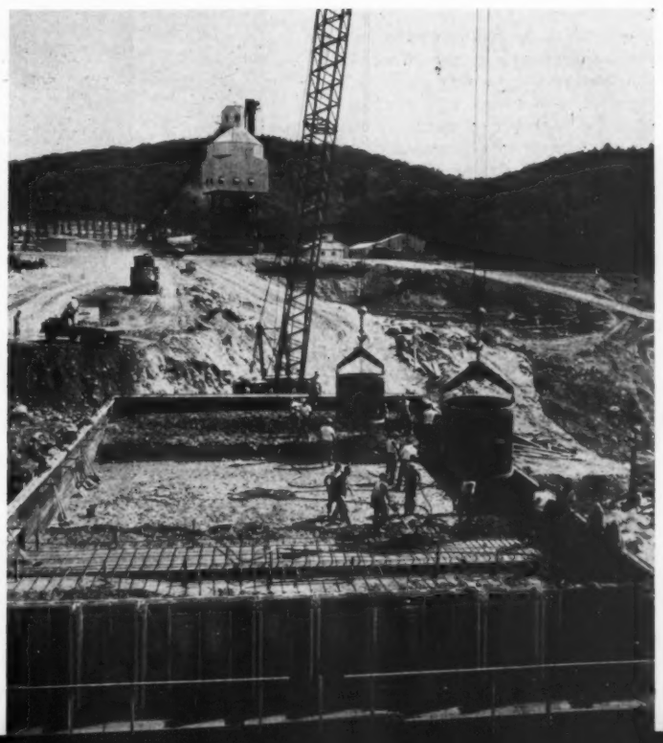


Here concrete is being placed in cantilever-type forms by two Manitowoc 3500 cranes. The concrete is hauled from the batch plant in Johnson 2-yard buckets placed on Ford flat-bed trucks.

This Johnson automatic batching and mixing plant produces 120 cubic yards of concrete per hour. Aggregate is carried to the top of the plant on a 344-foot-long inclined conveyor. The concrete is mixed in three Koehring 2-yard tilting mixers.





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dam. One Lorain dragline and one Koehring shovel work from dikes projecting into the river to keep a fleet of 10 dump trucks busy hauling the gravelly material to the processing plant near the dam.

At the plant, loaded trucks ascend one side of a timber and rock-fill ramp, dump into a bar grizzly, then descend on the other side. The material falls through the grizzly into a hopper, leaving oversize boulders on top. A vibrating plate feeder moves the material from the hopper onto a 24-inch-wide unloader conveyor, which carries it to the Pioneer Model 150 PG primary crushing unit. Here the material is fed to a 4 x 6-foot 1½-deck vibrating screen from which oversize matter is fed to a 20 x 36-inch jaw crusher.

The continuous system carries the material to a Pioneer Model 140-S secondary crushing unit where it is worked through the split feed of the 4 x 10-foot 3½-deck eccentric-type vibrating screen and a 40 x 22-inch roll crusher. Both primary and secondary units are powered by Murphy diesels.

From the secondary plant, the material is carried up a 160-foot-long conveyor to a Pioneer Model 405-W electric-powered washing plant. Here, a 4 x 20-foot tandem vibrating screen separates coarse aggregate, and an Eagle 22-inch x 22-foot twin screw handles the sand. All of the aggregates are received in three 45-ton bins below the plant. Two dump trucks load under these bins and haul a short distance to the aggregate stockpiles.

The plants are operated on a two-shift six-day basis and produce about 100 tons of aggregate per hour.

Moving the Aggregates

A short distance from the Pioneer processing plant, the aggregates are stored in a series of huge stockpiles separated by partitions of timber piles and planking. Dozers continually work the stockpiles to keep the aggregates heaped as high as possible.

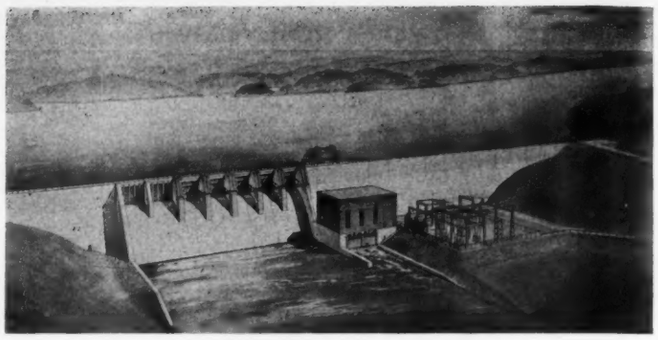
Running beneath the full 350-foot length of the stockpile group is a 5 x 7-foot timber-constructed reclaiming tunnel. Up to 20 clam-type gates set into the roof of the tunnel transfer aggregates to the 30-inch-wide Barber-Greene belt conveyor. Gates are set not more than 8 inches above the conveyor so that wear on the belt is kept to a minimum.

At the end of the tunnel, aggregates are transferred to a 344-foot-long incline conveyor which leads to the top of the Johnson automatic batching and mixing plant. One workman at the top of the plant directs the flow of aggregates into the proper bin through a swivel chute. Communication with the two men in the tunnel is achieved through a signal system of bells and colored lights.

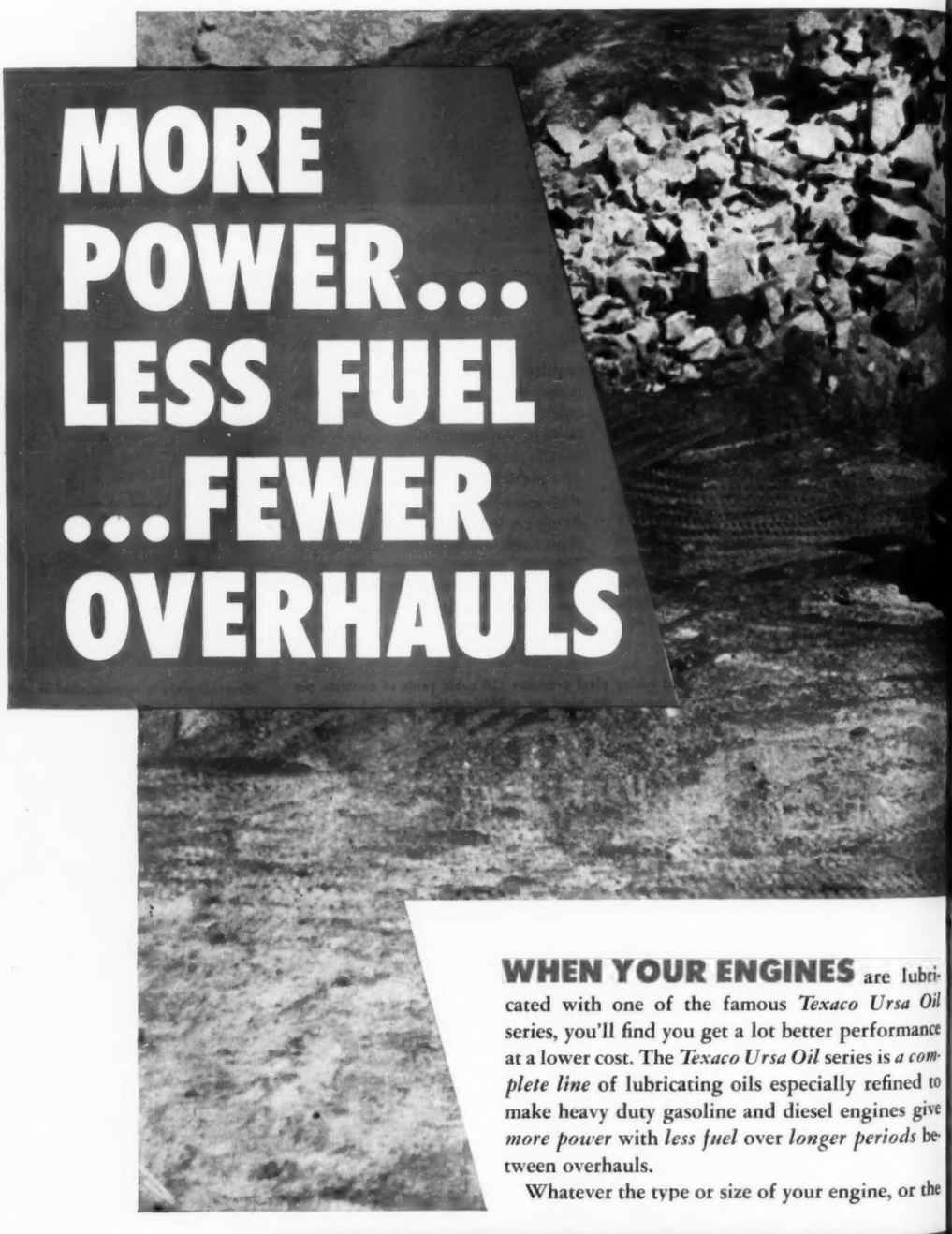
Batch Plant

Inside the 400-yard-capacity plant, batches are turned out fast and accurately as the operator works his push-button control panel. With one touch of a button, four sizes of aggregate plus sand and cement pour from the bins above, filling each weigh batcher with the proper amount of material. At the same time, an automatic recording is made of each weight. One more button is touched, the batchers open, and the complete ingredients for a concrete mix, including water, flow into one of the three Koehring 2-yard tilting mixers. The turbulent action of aggregates falling from steep-sided batchers does a first-class mixing job even before the materials reach the mixer. Each batch is mixed for 2 minutes and then dumped into a hopper below. The plant produces 120 cubic yards of concrete per hour.

Cement arrives in bulk cars at a railroad siding in Newtown and is transferred by screw conveyor and bucket elevator to a Johnson 585-barrel storage silo. Two covered dump trucks with a special cement-handling tailgate haul to the 875-barrel silo at the batch plant and dump the cement into a covered



Artist's conception of the Shepaug hydroelectric development on the Housatonic River near Sandy Hook, Conn. The $10,000,000 project is scheduled for completion by fall of 1955.



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hopper. From this hopper, it can be conveyed and then elevated into either the storage silo or a 400-barrel bin on top of the plant.

Two major mixes are used, a 4.5-bag mix for all exposed faces of the mass concrete section, and a 3.5-bag mix for all interior mass concrete.

Typical weights for a 3.5-bag mix are:

Cement	329 lbs.
Sand	1,110 lbs.
Stone:	
⅜- ¾-in.	410 lbs.
¾-1½-in.	485 lbs.
1½- 3-in.	690 lbs.
3-6-in.	975 lbs.
Water	28.9 gals.

Typical weights for a 4.5-bag mix are:

Cement	423 lbs.
Sand	940 lbs.
Stone:	
⅜- ¾-in.	400 lbs.
¾-1½-in.	475 lbs.
1½- 3-in.	675 lbs.
3-6-in.	930 lbs.
Water	27.1 gals.

Aerolith air-entraining agent is added at the plant at the rate of 4 per cent by volume.

Water for the batch plant and other purposes on the dam is drawn from a point upstream by four Ingersoll-Rand electric-powered 400-gpm pumps. These units, housed over a pool area in the river, distribute water to several parts of the job through an 8-inch line.

Concrete Placing

Concrete is hauled from the mixing plant to the dam in eight Ford flat-bed trucks, each mounting a circular steel frame for carrying a Johnson 2-yard bucket. On the early lifts, the buckets are handled by two Manitowoc 3500 cranes, one working on each side of the monolith. A steel trestle, to be set up parallel to the dam, will allow a revolver crane to reach the highest lifts and assist in the final closures.

The forms consist of Blaw-Knox steel cantilever panels designed for 5-foot lifts. The wood-faced panels are 10 feet long and are supported by two double 8-inch strongback channels 6 feet apart. The channels are anchored to the lower lift by two Richmond 1¼-inch bolts inserted 6 inches below the top of the lift and by two 3½-inch angles which act as bucking struts at the base. Each panel also has an outside work platform and handrail which cantilevers out from the strongback channels.

Concrete lifts are being placed by conventional methods. With two cranes working, the concrete is first placed at the ends of the monolitn and gradually extended across its full length. Lifts move up and out in 18-inch-thick steps to keep any area from setting.

Each bucket requires a crew of about eight men, including a foreman and a signalman. The workmen operate the Chicago Pneumatic two-man vibrator, open and close the pneumatically operated bucket, and shovel by hand wherever necessary.

Concrete Curing

Soon after each pour, the laitance is removed with an air-water jet. A perforated-pipe sprinkling system is then set up to cure the concrete for 14 days. The forms are removed after two days and lifted up for the next pour. Specifications require a minimum of 72 hours between pours of successive lifts.

Working one shift with some overtime, the contractor is averaging 800 cubic yards per day.

A grout curtain along the upstream face provides protection against any possible seepage through the rock under the dam. When sufficient lifts had been completed to create the proper pressure, 1½-inch holes were drilled 16 feet on center by Ingersoll-Rand wagon drills. Grout at a pressure of about 30 psi was then forced into the 30-foot-deep sloped holes, sealing up any possible voids and seams.

Second Stage

All of the monoliths inside the first cofferdam will be built up to completion, except the three closest to the river. Of these, the two flanking monoliths will be left below river level, while the center one will be built up 10 feet higher. The middle monolith will also have two 8 x 8 sluices.

At this point, the old cofferdam will be removed and transferred to the area at the south end of the dam. The river will then be diverted over the monoliths that were left down, and the south end of the dam will be completed behind the new cofferdam. When the three monoliths are ready to be closed, timber gates will be used to divert the water from each monolith being raised. When all three are above the river, sufficient water will be carried through the 8 x 8 sluices and the penstock to keep the downstream hydroelectric plant at Stevenson in operation.

Contractors Yard

Keeping men and equipment operating effectively on such a large job requires a number of service facilities. Compressed air, for instance, is supplied to the entire job by three electric - powered Ingersoll - Rand Type XLE stationary compressors, each having a capacity of 683 cfm. Housed in an adjacent building are two Superior oil-fired boilers with capacities of 7,600 pounds of steam per hour at 125 psi. During winter months, steam is used to heat most of the buildings, the aggregate stockpiles, water lines, and the concrete itself.

Housing for several of the shops is provided by three Butler prefabricated buildings—a 40 x 40 warehouse a 50 x 60 carpenter shop, and a 60 x 120 machine shop.

One of the features of the equipment maintenance program is the on-the-spot repair of stripped or worn threads. Helically wound coils of diamond-shaped stainless-steel

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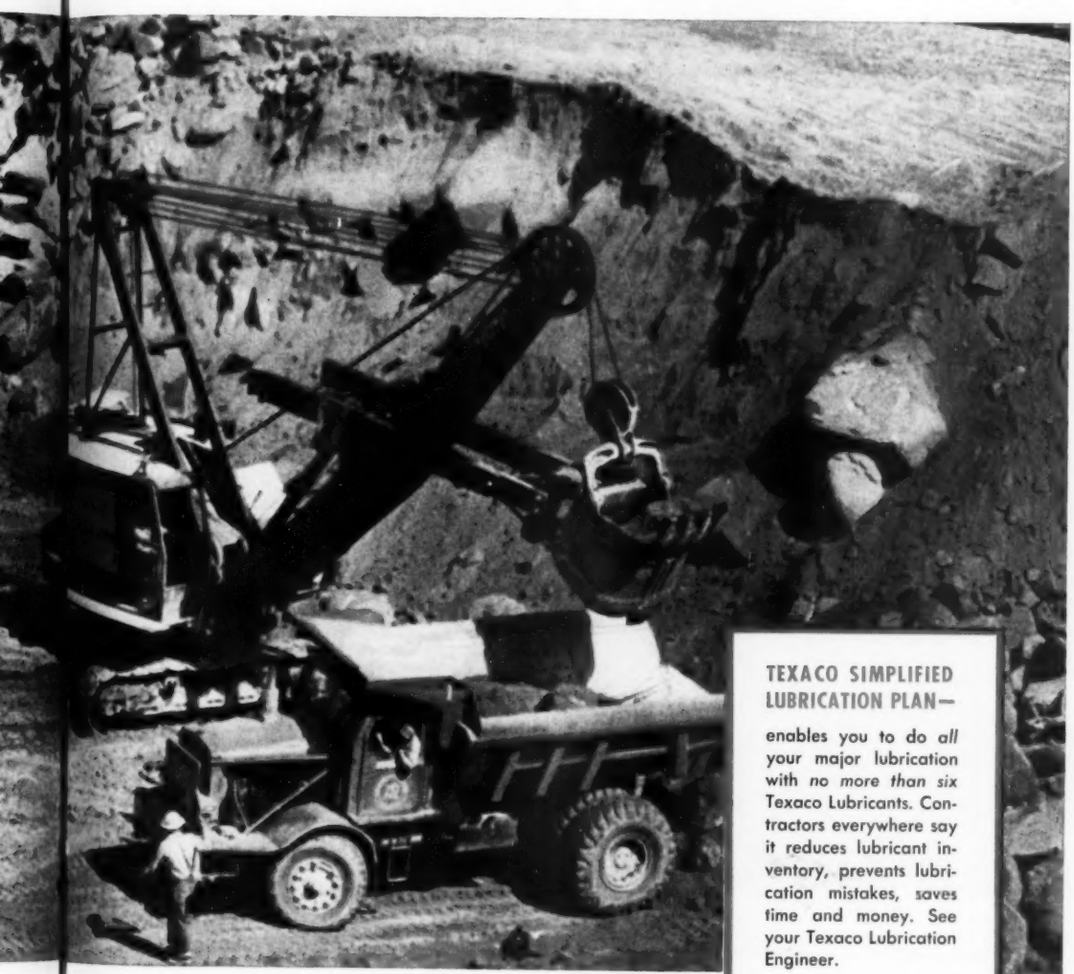

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In hydraulic mechanisms, use *Texaco Regal Oil R & O*. It has *more than ten times the oxidation-resistance* of ordinary turbine-quality oils in this service, keeps systems free from rust, sludge and foam. To keep wire rope strong longer, use *Texaco Crater*. Also ideal for open gears.

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Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

An inside view of a Butler building housing a carpenter shop on the project site. Two other Butler prefabricated units serve as a warehouse and a machine shop.

(*Concluded from preceding page*)

wire, called Heli-Coil screw thread inserts, form female threads the same size as, but stronger and more wear-resistant than, the original threads.

The technique involves simply drilling out the old threads, retapping the hole, and turning in the insert. A portable air drill or electric drill will do the job because the old hole will serve as a guide. Both the tapping operation and the inserting operation can be done by hand. The technique does not require heat, such as a welding operation, which presents a fire hazard. It can often be accomplished without removing the outer section of a housing or otherwise dismantling the equipment.

United Engineers & Constructors have used the wire thread inserts in the repair of truck cranes, tractor roller track frames, and pump valve cases. THE END

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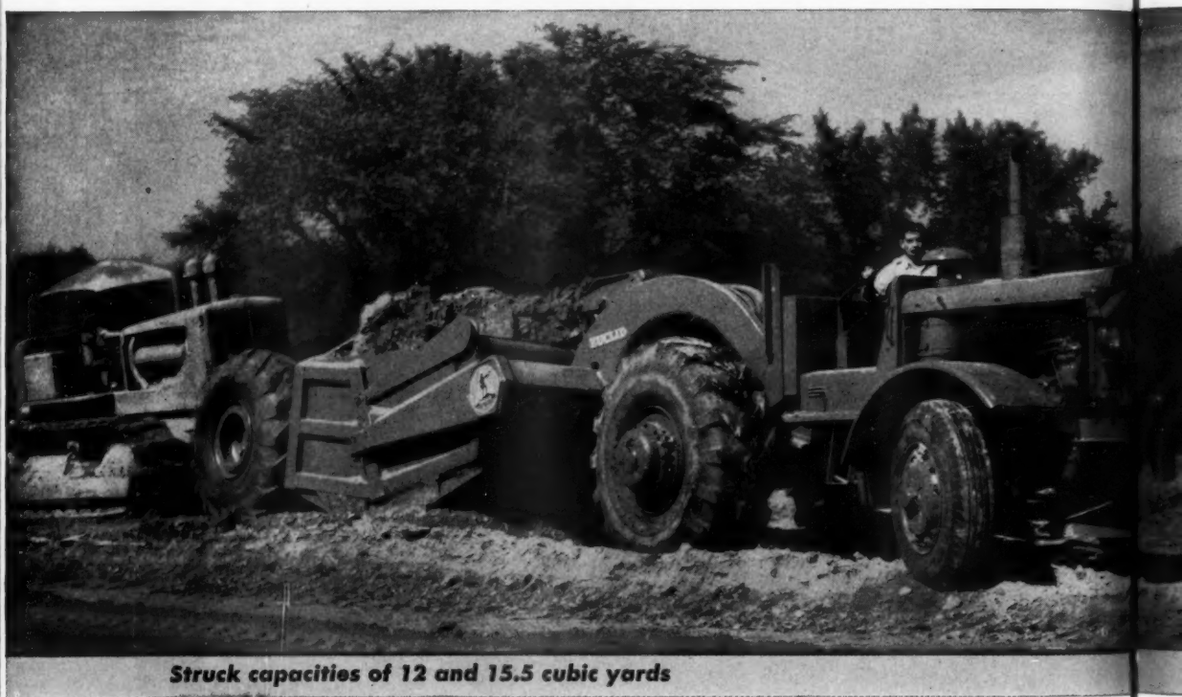

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Euclid Scrapers have profit-making features that pay off in high production at low cost. Owners know from experience that they get more pay yards per hour with lower operating and maintenance cost, and that means low cost per yard.

They know, too, that "Euc" Scrapers have unequalled job availability because of their simple, rugged design and easy servicing. For example, there's no down time due to cable breakage because all scraper operations are lever actuated and independent . . . and the adjustable, long-life cutting blade with four identical and reversible sections assures peak production in all types of material from sand to sticky clay.

For performance and production data on work similar to yours, have your Euclid distributor provide helpful facts and figures on "Euc" Scrapers and see the new color movie, "Equation for Profit" that shows how "Eucs" can improve the profit picture on your earth moving work.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio •

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GENERAL MOTORS

R. P. McKenrick, left, new chairman of the Manufacturers Division of the National Sand & Gravel Association, is congratulated by Emory Heuston, retiring chairman, at the annual meeting of the association. Mr. McKenrick is manager of the construction equipment department of Blaw-Knox Co., and Mr. Heuston is publicity manager for Bucyrus-Erie.

Study Design of U. S. Airfields in Spain

A 12-man evaluation team representing the U. S. Army and Air Force is working with Spanish engineers in making soil surveys at four proposed American airfield sites in Spain, the Department of the Army has announced. The studies are being conducted to determine the most satisfactory design for airfield pavements at the proposed bases.

The American engineers are studying the load-bearing capacity of existing runways and surveying adjacent soil and drainage conditions to ascertain improvement potentialities of the airfields. Six civilian geologists, soil and pavement engineers, an Army Corps of Engineers officer, and five airmen comprise the team.

Porcelain Enamel Uses Are Treated in Report

Papers on the properties of porcelain enamel, its use in building design and its use as an engineering material are continued in a bound report of the proceedings of the conference on porcelain enamel in the building industry. The volume covers sessions of the conference held last November under the sponsorship of the Building Research and Advisory Board and the Porcelain Enamel Institute.

The actual use of the material for hospitals, houses, and industrial buildings, together with the problems involved in construction, solutions worked out, and costs, is discussed and illustrated in the fourth section of the book. Copies of the book, "Research Conference Report No. 6", can be ordered for $6 from the Building Research Advisory Board, 2101 Constitution Ave., Washington, D. C.

Gain in Traffic, Receipts On Pennsylvania Turnpike

The number of vehicles using the Pennsylvania Turnpike during 1953 showed an increase over the previous year's figure by 5.6 per cent, according to a report of the Turnpike Commission. Total revenue from the superhighway—$23,412,724.29—was up 10 per cent.

The commission's statistics showed that a total of 12,017,032 vehicles used the turnpike during the calendar year 1953, and that mileage driven totaled 1,205,329,762 miles for an increase of 5.6 per cent. Gross vehicle revenue accounted for $22,124,936.56 of the year's total receipts.

Accident and fatality statistics showed increases over the previous year of 11.3 per cent in the number of fatal accidents, and 9.6 per cent in the number of fatalities. The total accident rate was down 10.5 per cent, and injuries due to accidents decreased 16.4 per cent.

LeTourneau-Westinghouse To Build Brazilian Plant

In order to provide modern earth-moving equipment for the Brazilian market, LeTourneau-Westinghouse Co., Peoria, Ill., a subsidiary of Westinghouse Air Brake Co., will build a new plant in Brazil for operation as a subsidiary of LeTourneau-Westinghouse. The plant will be the property of Tratores do Brasil S. A., and will cover 25 acres of land about 60 miles from Sao Paulo.

Afranio A. Ferreira, the LeTourneau - Westinghouse representative in Brazil, will be the president of the South American organization. Two employees from the LeTourneau-Westinghouse plant in Peoria, Willard Arnold and Charles Propes, will go to Brazil to oversee construction and manufacturing operations, and to assist in determining the initial products to be manufactured by the plant.

Remember—Safety Is No Accident!

Performance Pays Off in Low Cost Production

Working on a highway relocation job in Arkansas for contractor D. B. Hill, "Euc" Scrapers of 12 cu. yd. struck capacity spread their loads on the run. Time saved in loading, speed on the haul, and fast dumping on the fill cuts down cycle time, steps up production.

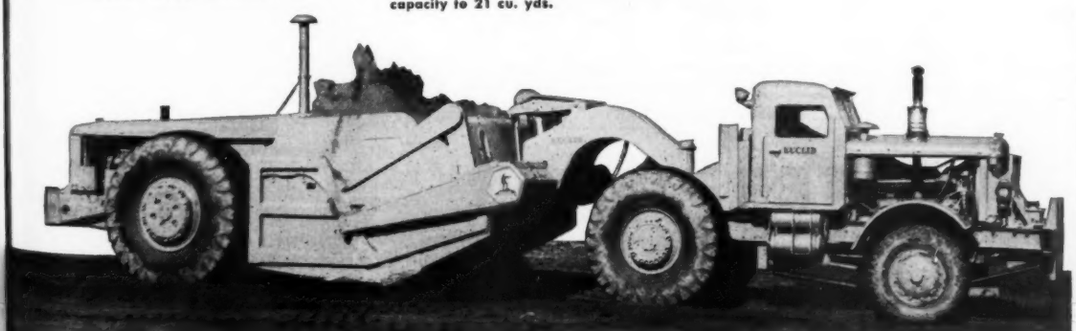
▲ A fleet of nine 15.5 yd. "Euc" Scrapers helped rush a big plant-site grading job in Kentucky to completion ahead of schedule. They maintained high hourly production because of their fast travel speed with heaped loads up to 21 cubic yards on hauls averaging 1,950 feet.

◀ Fast, easy loading with more pounds of payload than other equipment of comparable size on many competitive demonstrations has made Euclid Scrapers the first choice of contractors and an important part of their profit picture.

High production with one man and one machine!

Western Contracting Corp. found the Twin-Power Scraper a versatile machine for their work on the Ohio Turnpike. On one section, carrying average loads of 23 cu. yds., a complete 4700' cycle was made in only 5.3 minutes. Top extensions increased the struck capacity to 21 cu. yds.

Only Euclid builds a Twin-Power Scraper



Before you invest in any earth moving equipment, check with your Euclid distributor and be sure to see the new scraper film "Equation for Profit".

EUCLID DIVISION GENERAL MOTORS CORPORATION Cleveland 17, Ohio

All-Borrow Material for 8-Mile Highway

An 8.1-Mile highway relocation project in progress 150 miles south of Salt Lake City, Utah, at a point where U. S. 89 passes through the agriculturally rich Sevier River Valley, is meeting some unusual construction problems. Because the road runs through flat farmland, construction is entirely on a borrow-material basis. L. A. Young Construction Co., Richfield, Utah., has the $553,114 contract with the Utah State Road Commission.

The relocation job includes all phases of modern highway construction. Young's contract calls for grading, drainage, production and placing of all base-course material, and plant-mix surfacing, as well as construction of two reinforced-concrete box culverts and a 60-foot-span bridge structure. The bridge crosses the river about 2 miles south of Salina, Utah.

The job was begun last August and is expected to be completed by June 1 of this year.

The project will replace one of the oldest bituminous stretches on U. S. 89 and, by reducing curvature and increasing sight distances, will make the well traveled north-south route to and from scenic national park locations a much safer route. Undertaken with the help of federal funds, the job is part of the ambitious construction program which the Utah Road Commission has scheduled.

The new highway passes through valuable farmland which for several generations has been cultivated and irrigated. A right-of-way 200 feet wide was purchased for the new location. After extensive study, Utah's engineers determined that a subgrade fill with an average height of only 1.5 feet—but in one case reaching an 8-foot maximum—would place the road above surrounding country and provide sufficiently firm foundation for a busy highway. Since it was impossible to balance cuts and fills, an all-borrow arrangement was planned to include 240,000 cubic yards of subgrade material and 74,000 cubic yards of select granular material.

The roadbed for the new highway ranges in width from 40 to 50 feet, and is topped full width by 9 inches of select granular material up to 6 inches in size. Specifications for this ballast call only for a well graded, nonplastic, granular formation not greater than 6 inches in size, with not more than 15 per cent of material passing the No. 200 screen, and no particle of which when placed will be greater than ⅔ of the thickness of the compacted lift.

Topping this 9-inch select course is 3 inches of a 2-inch-minus granular subbase, with gradation requirements as follows:

Sieve Size	Per Cent Passing
2-in.	100
1-in.	60-100
No. 4	30-60
No. 200	3-10

Topping this course is a 3-inch layer of 1-inch-minus select, crushed, leveling-course material. Its specifications are:

Sieve Size	Per Cent Passing
1-in.	100
½-in.	85-100
No. 4	45-65
No. 10	30-50
No. 200	5-10

PI—Nothing greater than 6
LL—Nothing greater than 20

Three inches of plant-mix asphalt surfacing, prepared by a hot-plant and using 100 to 120-penetration asphalt cement, is being placed over the top of this entire granular base structure. This plant-mix surface is lightly flushed by a seal coat of asphalt to make the structure watertight. Later on, the surface will be sealed by state maintenance crews. The thickness and durability of this subbase indicate the heavy highway construction needed for roads carrying today's 18,000-pound axle loads.

Trouble With Irrigation

One of the first problems encountered was presented by existing irrigation ditches. For many years, farmers in the Sevier River Valley had irrigated the land by means of

Here's why a Texas contractor finds

IT PAYS TO BE ALL-CAT*

E. E. Hood and Sons of San Antonio, Texas, are 100% Caterpillar-equipped. Ranney V. Hood, co-owner of the firm, tells why:

"We feel that Caterpillar equipment is the best made.

"We can move half again as much material in the same amount of time.

"If we have to work on our Cat machines, parts are easy to get and repairs are easy to make."

The Cat-powered Bucyrus-Erie 1½-yard shovel shown here makes a swing in less than 15 seconds, loads a five-yard truck in 54 seconds. That's fast, cost-cutting production! The firm is reconstructing farm-to-market highway No. 346, south of San Antonio.

In addition to the Caterpillar D13000 in the shovel, Hood and Sons own two D13000s in a crusher, four Cat No. 12 Motor Graders, seven Caterpillar track-type Tractors, and two Cat rubber-tired Tractors with Scrapers.

Mr. Hood especially likes the dependability and low operating costs of Caterpillar products. The D13000 in the shovel has cut production costs through nearly 8000 hours of pamper-free operation. And, like all Caterpillar Diesels, it can deliver full power, and idle without fouling, on low-cost No. 2 furnace oil.

Experienced contractors like Mr. Hood find valuable "pluses" in standardizing on Caterpillar products: increased operator familiarity, ease of maintenance, simplified parts inventory. There are 12 Caterpillar Engines and Electric Sets, to 500 HP and 315 KW. Your Caterpillar Dealer—who furnishes fast, skilled service and genuine factory parts—will help you pick the unit that's just right for *your* needs. When you repower, or order new equipment, be sure to specify Caterpillar power. Leading manufacturers of excavators, compressors and other construction machinery can furnish Cat Engines in their equipment.

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A WORD TO THE WISE—STANDARDIZE!

New location in flat farmland area of Utah creates problem of hauling fill for heavy subgrade, subbase construction

This Cedarapids portable rock plant turns out crushed material for the Utah highway job. Project plans call for a total plant output of more than 100,000 tons, including a 10,000-ton stockpile for future use. *Ray Day Photo*

small diversion ditches and canals. At many points, these ditches crossed the path of the new highway. Near the Salina end, it was not unusual to have an irrigation ditch every 500 feet or so.

To carry this irrigation water under the highway, Utah's road engineers had specified nearly a mile of corrugated metal pipe; but the proper transportation of this irrigation water depended on much more than the mere installation of the culverts. Grading equipment which Young proposed to use weighed 51 tons fully loaded, and the pipes, after installation, had to be covered with enough dirt to protect them from being crushed. The actual installation job was easy enough—a Model E Quick-Way truck-mounted backhoe moved in, mucked out the trenches, and installed the pipe. In several spots where the highway crossed marshy ground, temporary fills had to be built.

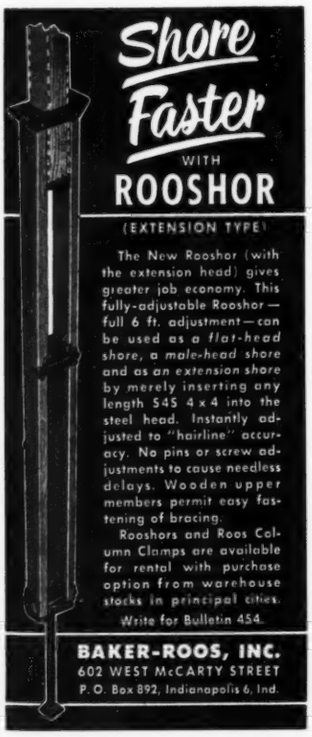
Each of the pipe trenches was then covered by hauling imported subgrade material and arching it over the culvert pipe. By using a minimum of 4 feet of well compacted earthfill over the line, the contractor was able to operate heavy machinery over the trenches with the loss of only one crushed pipe.

Subgrade Built Rapidly

Hauling in of the 240,000-cubic-yard subgrade was made easier by the use of two separate spreads of equipment. The roadbed site was first cleared of all growth by a dozer. The site was covered generally only with such agricultural growth as is found in the Sevier River Valley area, and this material was quickly stacked and burned.

The two spreads of hauling equip-

(Continued on next page)



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VICTORTUBE "SPECIAL"	Abrasion, severe impact	Oilfield bits, rock bits	Acety. only
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VICTORITE	Earth abrasion or sliding friction	Plowshares, cultivators, steel mill guides, cement chutes, shaft bearings, rolling mill guides	Acety. AC-DC Elec.
TUBE VICTORITE	Abrasion, impact	Plow points and farm tools	Acety. AC-DC Elec.
VICTORITE 1	Corrosion, heat, abrasion	Saw teeth, carbon scrapers, wire guides, rocker arms, steel mill applications	Acety. AC-DC Elec.
VICTORITE 6	Red heat, impact, corrosion and abrasion	Blanking, forming and trimming dies, cams, hot punches, pump shafts	Acety. AC-DC Elec.
VICTORITE 12	Heat, abrasion, impact	Saw blade inserts and other critical applications	Acety. AC-DC Elec.
VICTORITE CARBON ARC	High abrasion, thin deposit	Plowshares, lister shares, sweeps	Carb. arc Acety.
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H-11

A Caterpillar D8 dozer levels off select gravel base hauled to the construction site from distances up to 3½ miles. The 8-mile stretch of new highway was given a subgrade fill averaging 1.5 feet in height. *Ray Day Photos*

(Continued from preceding page)

ment were selected to meet the special long-range haul condition. For a 5-mile stretch on the Salina end of the road, there was a 1½-mile haul in one direction and a 2-mile haul in the opposite direction, plus a third pit nearby. For this job, Young first assigned two La Plant Choate scrapers, which were replaced in a few shifts by two new Caterpillar DW21's and one LeTourneau-Westinghouse Tournamatic hauling unit. The DW21's were rated at 23 cubic yards per trip, and because of the small swell factor, checked out at about 18 cubic yards of pay volume. The Tournamatic machine hauled 12 bank yards per trip.

Loading with the help of an International TD-24 pusher, these three machines worked from two pits to bring in about 65 per cent of the total yardage. The sandy, nonplastic material was laid down by the machines in approximately 8-inch lifts, then bladed smooth by a Caterpillar No. 12 motor grader. Moisture was added by two water trucks which hauled from irrigation ditches and wells close by. Two sets of tractor-drawn sheepsfoot rollers made an average of five passes—representing ten passes of a single roller—over the roadbed to develop the required compaction.

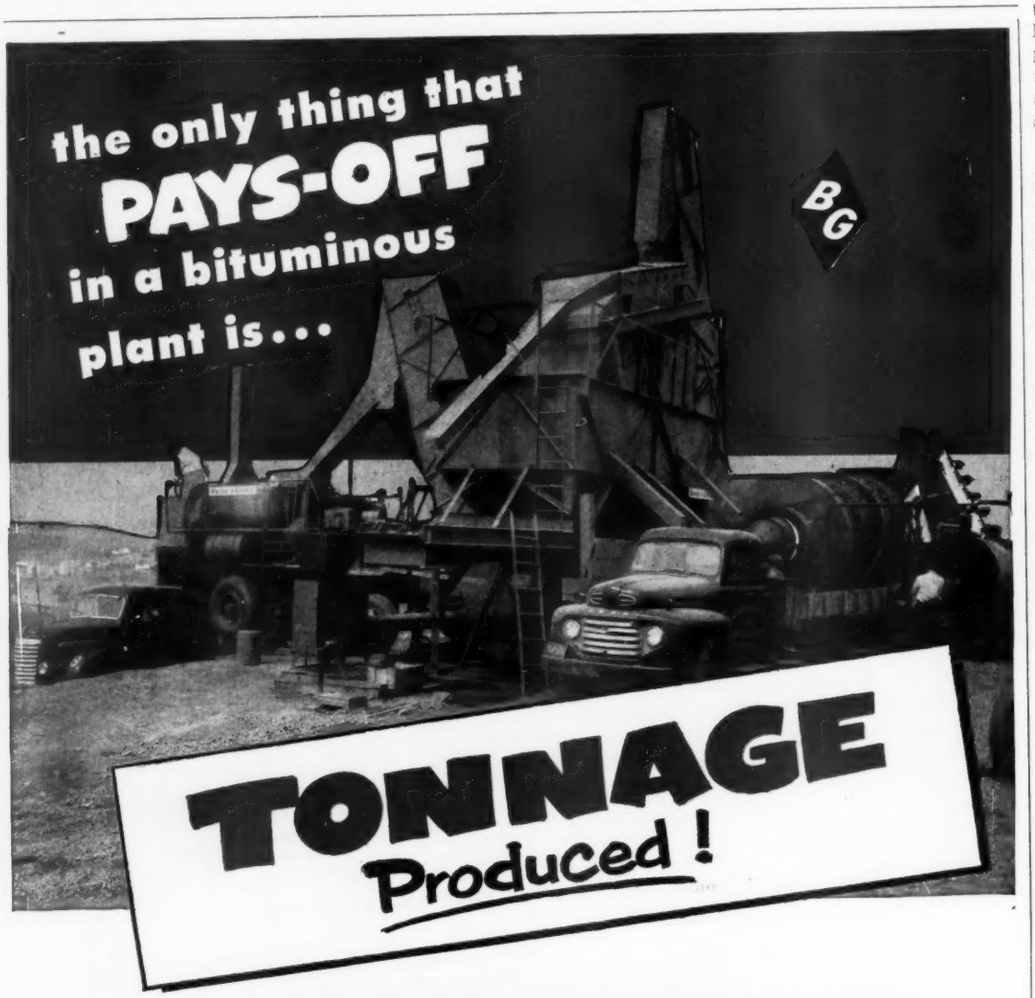
The second spread of machinery was a truck-and-shovel outfit composed of 9 International L-190's and L-180's, a Northwest Model 25 shovel, and a Bucyrus-Erie Model 22-B shovel. Both shovels were rated at ¾ cubic yard. This equipment spread was used on hauls ranging up to 3½ miles. The material was dumped in sufficient volume to make an 8-inch lift, spread and leveled by a Caterpillar D8 dozer, processed with moisture, and then rolled with sheepsfoot equipment similar to that used on the DW21 spread.

By working rapidly through favorable autumn weather, the crews were able to complete about 90 per cent of the subgrade work before freezing weather set in. By that time, the subgrade had been compacted and blade-dressed to tolerances close enough to permit placing of the select material.

The 9-inch course of select gravel was also produced from pits along the higher part of the Sevier River Valley. This material was loaded by the Bucyrus-Erie 22-B, working against a 10 to 12-foot bank to get the best possible blend during the hoisting cycle. The production and hauling of this material continued through the winter months. In the spring, the select gravel was scheduled to be blade mixed, moistened if necessary, and rolled down tight by a Southwest pneumatic roller.

Big Crushing Assignment

One of the major items in the job



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is the amount of crushed rock, from three pits, scattered over the project. Before the job is finished, the rock-crushing plant will have produced 30,500 tons of mineral filler for the plant mix, 32,000 tons of 2-inch-minus base, 31,000 tons of 1-inch-minus base, a 10,000-ton stockpile of 1-inch material for future use, and 5,000 tons of stockpiled armor chips 7/10-inch-minus in size.

This entire crushing job is being handled by a remodeled Cedarapids crushing and screening plant which the Young organization has used on many a highway job in Utah and Nevada. Basic changes include conversion of the drive arrangement to sprocket and chains, and an enlargement of the screen decks from 3 x 10 to 4 x 12 feet.

By first digging a small pit with one of the power shovels, rock men were able to install the Cedarapids plant for a gravity feed. The setup is about 12 feet lower than the natural pit surface.

In the operation of the plant, raw material is shoved by an International TD-24 and a Caterpillar D8 dozer to a grizzly-covered trap, where a belt feed carries minus 10-inch material out to an elevating conveyor run. This conveyor dumps the raw material onto a double 12 x 4-foot screen deck situated on top of the plant. Fine material drops at once through both vibrating screens and is shunted by conveyor directly to a 20-ton surge bin.

Oversize material scalped off the top deck passes through a Cedarapids 10 x 36 jaw crusher, while oversize material retained on the bottom screen deck passes through a set of Cedarapids 18 x 32 rolls. Both the roll and jaw crushers are arranged in closed circuit with the top screen deck by means of a bucket-type elevator, and the crushed rock is rerouted continuously until it is reduced to required size.

The plant gets its power from a Caterpillar D13000 diesel-electric set, and will make three setups to produce the necessary tonnage. One set of performance figures calculated over a week's time shows 2,000 tons in 8 hours, and 1,500 tons in the same period on 1-inch material.

The installation of 2 and 1-inch-minus crushed rock base is one of the most carefully controlled operations on the project. These upper layers of base course are designed to enhance the structural strength of the road and to transfer loads to other parts of the subbase and subgrade beneath. Every known method is used, therefore, to assist in developing the greatest strength from this material. The windrows are blade-mixed to get a thorough blend of round and angular particles. Moisture is added to bring the material up to its optimum content of about 8 per cent. Motor graders cut

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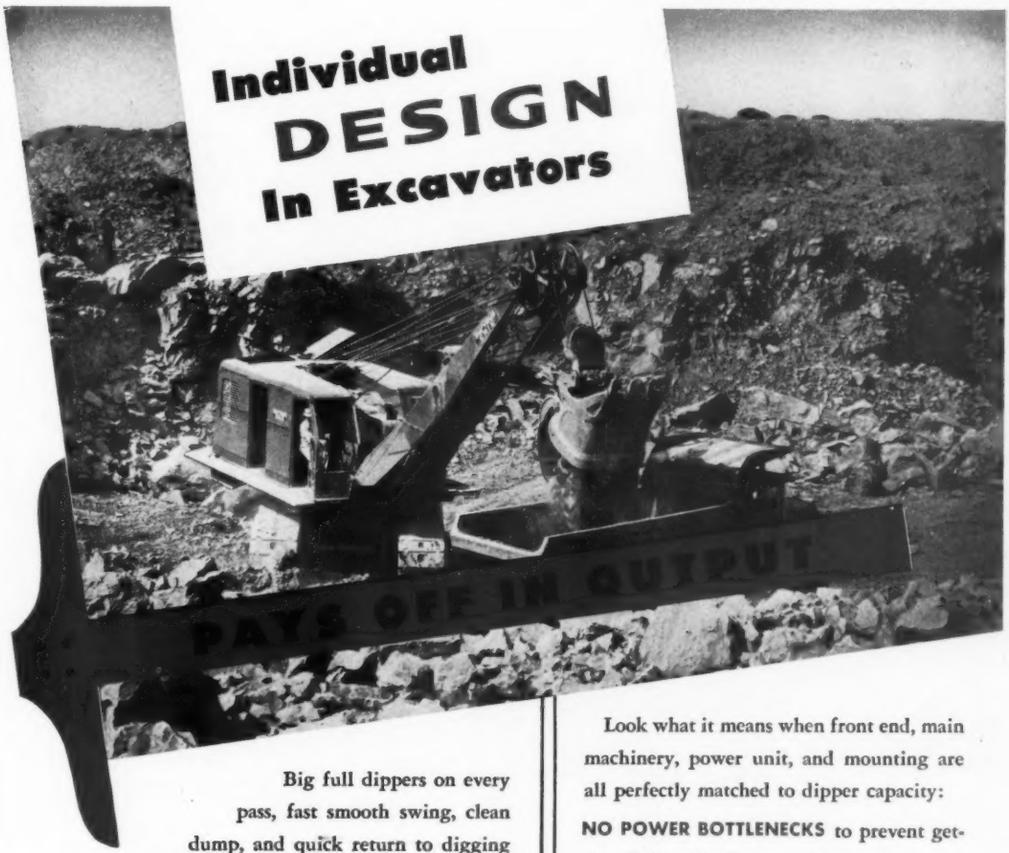
General Superintendent Vernon K. Long (left) of L. A. Young Construction Co., Richfield, Utah, and resident engineer Bert Swain, representing the Utah State Road Commission, pose on the job. *Ray Day Photos*



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(Continued from preceding page)

the material out of windrows in thin lifts, and Southwest heavy rubber-tire rollers develop the necessary high compaction. When the final topping course of 1-inch-minus is in, the roadbed will be ready for priming and plant-mix. The presence of full-width granular subbase insures adequate drainage.

Bridge Over Quicksand

One of the more complicated aspects of the job was the construction of a reinforced-concrete bridge, designed for H20-S16-1944 loading, across the Sevier River. The bridge, which is of conventional T-beam design, has a 60-foot clear span and a roadway width of 32 feet curb to curb. Its two abutments rest on 40 wood piles 35 feet long. The problem lay in the fact that the abutments were to be located in an area of the river bottom where there was quicksand.

Faced with uncertain ground water conditions and the possibility of construction delay and lost-time expense, the contractor called in the engineering experts of John W. Stang Corp., Bell, Calif. A field study was made in which underground soil structure, ground water flow, and related hydrological characteristics were carefully considered. As a result of this study, Stang's engineers recommended the installation of a Stang wellpoint system encircling the north abutment nearest the river channel. A temporary earth cofferdam had been built to shove the stream around this abutment, and the water was carried through a 54-inch corrugated pipe during construction.

The wellpoint system was installed by jetting and proved entirely successful. Only 10 hours after the pumps began operation, groundwater levels had dropped so that excavation could begin. In spite of the presence in one corner of impervious clay lenses above the 13-foot level of the wellpoints, the area was successfully dewatered. Both abutments were then excavated by a Northwest 25 dragline, making an open cut with 1 to 1 sideslopes, and the wood piles were then driven by that machine and a pile hammer. The entire rental period on the wellpoint system was only 45 days.

Excavation of the abutment foundation material to a depth of about 7 feet, and the pile-driving job were done by Shurtleff & Andrews, Inc., Orem, Utah, general contractors, under a crane rental agreement. As soon as the piles had been driven, prefabbed forms consisting of shiplap facing, 2 x 4 studs, double 2 x 6 wales, and wire ties were installed. Higher up, where the concrete was to be exposed to view, Masonite facing was used on the form panels.

The concreting system was conventional for a small operation. Ideal Type II portland cement with air-entraining agent already added was delivered from Salt Lake City. Two sizes of rock aggregate and one size of sand were supplied locally from a commercial plant on the Sevier River at Richfield, about 12 miles from the south end of the highway section. Stockpiled at the site, these materials were then loaded to a 3-compartment bin equipped with a set of Thurman beam scales. The batches were dumped to the skip of a small Kwik-Mix Dandie concrete mixer and placed by the crane and an Insley ¾-yard placing bucket.

The bridge deck was cured by wet sand, while a water cure was used on the remaining part. Exposed surfaces were given a double rubbing with abrasive stones to enhance the architectural effect. The same concrete setup and form carpentry was also used on the construction of two reinforced-concrete culvert boxes.

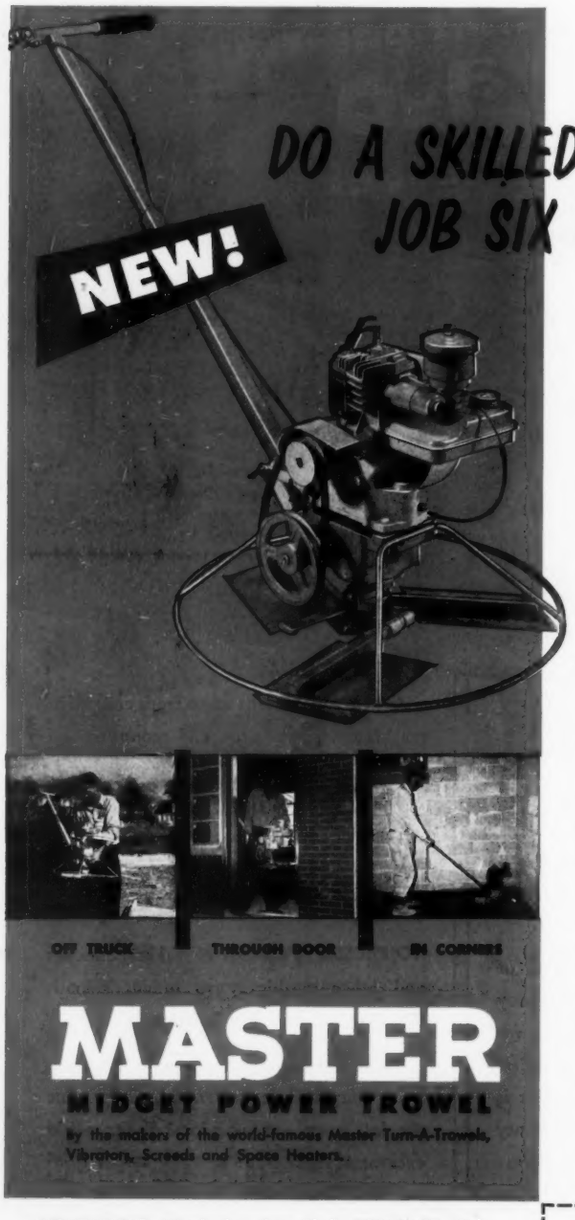
Personnel

The project is being constructed by the State Road Commission, of which D. H. Whittenburg is chairman, and is under the general supervision of E. G. Johnson, chief engineer. S. Fiack is construction engineer; J. B. Skewes, district engineer at Richfield; and Bert Swain, resident engineer.

For the contracting organization, L. A. Young personally supervised the operation. He was assisted by Vernon K. Long, superintendent, and Ervin L. Christensen, rock plant superintendent. THE END

Named Teco Office Manager

Warren E. Racine this month assumed the management of the Chicago office of Timber Engineering Co., research affiliate of the National Lumber Manufacturers Association.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"Oh, she'll be comin' 'round the mountain when she comes—"

Final Stage of WASHO Road Test in Idaho

Full-scale traffic is being operated at the site of the WASHO road test in southeastern Idaho through this month as the concluding phase of field testing being conducted by the Highway Research Board. Studies will be made of pavement deflection under loads, deformation, and other aspects of durability after shutdown of traffic at the end of the month.

The test project, in which effects of traffic loads during all seasons of the year except winter are being studied, is being conducted by the Highway Research Board for eleven western state highway departments, the territory of Alaska, the Bureau of Public Roads, truck and trailer manufacturers, and certain petroleum companies. The test tracks consist of two practically identical loops with 1,900-foot straightaways. One loop is for tandem-axle vehicles and the other for single-axle vehicles. Each tangent has five different flexible pavement sections varying from 6 to 22 inches in total thickness of gravel and asphaltic concrete over a silt subgrade soil.

Illinois Tech Leads In Engineering Enrollment

For the seventh consecutive year, the Illinois Institute of Technology, Chicago, Ill., leads the nation's colleges and universities in the number of students enrolled in engineering courses. *The Journal of the American Society for Engineering Education* reports that 4,743 undergraduates and 591 graduate students comprise Illinois Tech's engineering enrollment.

Accredited schools throughout the nation report a total of 171,832 engineering students enrolled for the current year. The figure marks an increase of 8.4 per cent over 1952.

McGraw Has Busy Year

The annual report of F. H. McGraw & Co., New York, N. Y., engineers and contractors, shows a volume of engineering and construction costing more than $190,000,000 completed during 1953. Most of the work was done at Paducah, Ky., where the company is building a $1,000,000,000 plant for the AEC.

The company announced a total income of $318,401 for the year, or a net profit of $185,950 after taxes. Profits during 1952 amounted to $28,799, it was reported.

New Texas Highway Map

The 1954 Texas Official Highway Travel Map, containing a number of changes and new features, has been published and is available without charge from the Texas Highway Department, Austin 14, Texas.

More than 1,300 cities, towns, and villages are included in the new guide, with the limits of cities of over 100,000 population shown in broken outline. Highway routes through 13 of the state's larger cities are detailed in insets at the margins of the map. A new feature is a relief map, showing the contour of the land in brown shading.

To improve the map's legibility, the width of highway bands has been reduced, and type has been used for all names and symbols instead of the hand lettering used in previous years. Various sizes and faces of type distinguish the 30 categories listed, which include cities, counties, rivers, and mountains.

Building Award to Twaits

The Construction Industries Committee of the Los Angeles Chamber of Commerce recently presented its sixth annual Achievement Award to Ford J. Twaits, longtime Los Angeles contractor. The award was made at the 19th annual Gridiron banquet sponsored by the Committee.

Mr. Twaits has been a Los Angeles contractor for 42 years, and his firm has constructed many of the buildings dominating the coastal city's skyline. He is the founder and past president of the Southern California Chapter of Associated General Contractors of America.

The Achievement award is presented each year on the basis of lifetime achievements in public service, service to the construction industries, public relations, and in the science of design, construction, and materials.

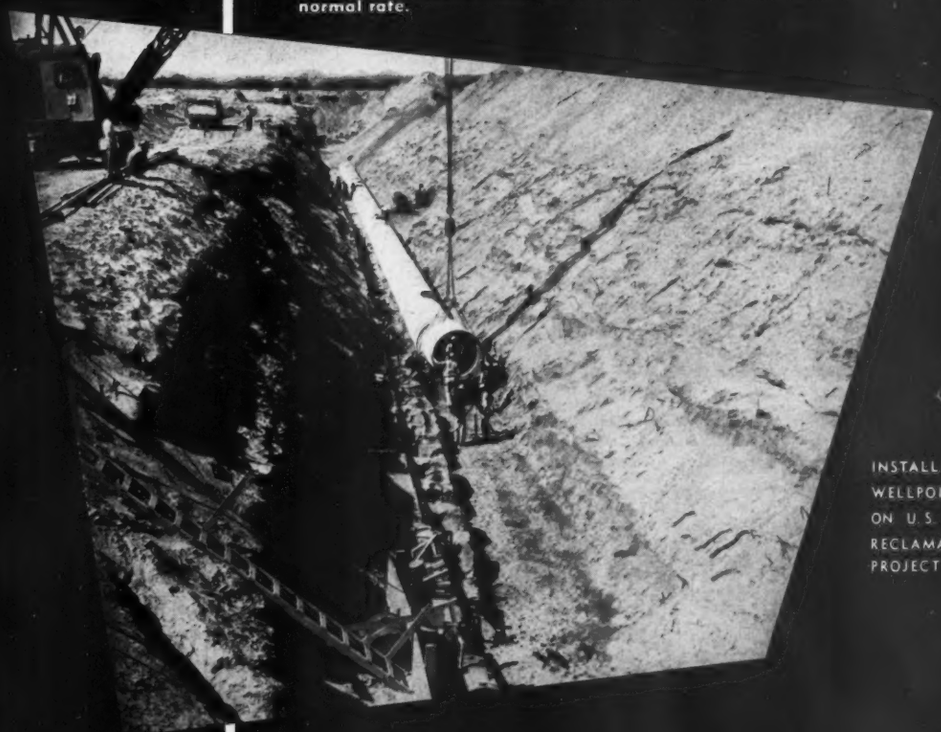
Treacherous soil made SAFE in deep cut in fine wet sand

Treacherous soil conditions were encountered in this excavation for the installation of a Pipe Line Siphon under the bed of the Gila River for the U. S. Bureau of Reclamation Gila Project at Wellton, Ariz.

For a quarter of a mile the cut was 25 ft. deep in extremely light and fine sand, with little cohesive quality of the particles.

Ground Water at subgrade, and excavation into the wet material caused continuous sloughing of the dry soil above.

So the contractor installed a Stang Wellpoint System . . . the cut was quickly and economically stabilized . . . and pipe laying proceeded at a normal rate.



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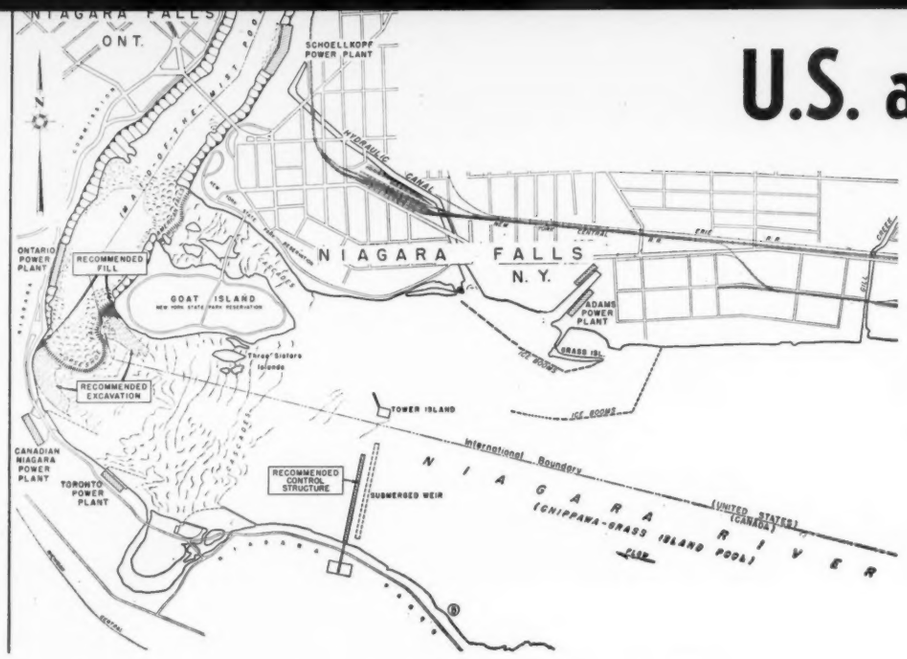
U.S. and Canada Start Ni



A map of the Niagara River, showing the remedial works to be built by the U. S. and Canada. Construction includes excavations totaling 128,000 cubic yards, fills, and a control structure.

Control facility and fills are part of $17,536,000 program to check erosion and aid power development

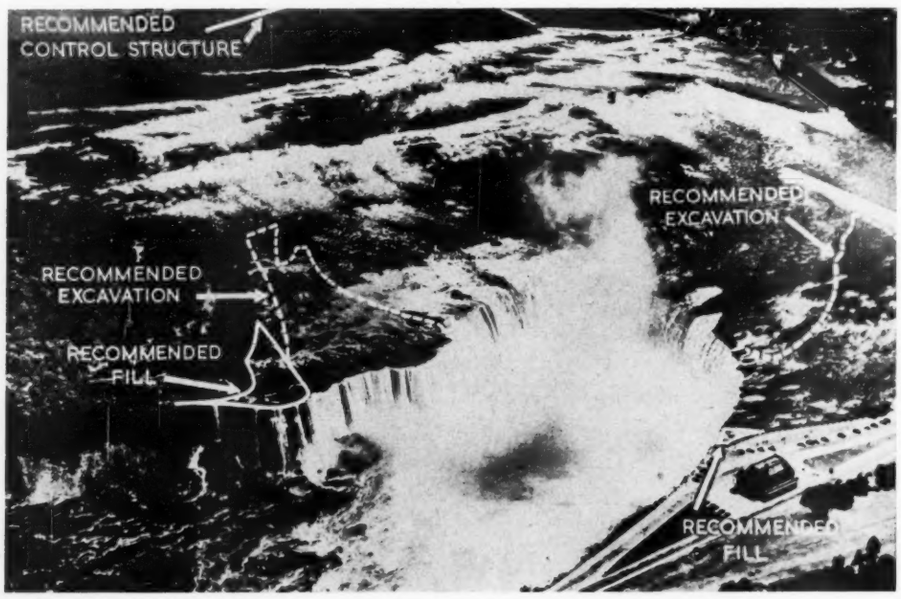
By LEON H. DURST, Chief, Technical Liaison Branch, U. S. Army Corps of Engineers, Great Lakes Division

IN AN EFFORT to prevent the Horseshoe Falls at Niagara from destroying itself, United States and Canadian engineers have embarked on a four-year remedial works program designed to check erosion and preserve the beauty of the falls. Under the program, a major control dam will be constructed upriver from the cataract, and excavations and fills will be made on the American and Canadian side of Horseshoe Falls. The estimated cost of the work, $17,536,000, will be shared by the U. S. and Canada under the terms of the 1950 Niagara Diversion Treaty. Both countries will also share the annual $100,000 maintenance cost.

The objectives of the program are to distribute the river waters so that an unbroken curtain of water will be made to flow over the Horseshoe Falls, which lies midway between the U. S. and Canada, and to contribute to the most effective use of water for power production purposes.

The control structure will maintain the upper Niagara and Lake Erie at current levels, make it possible to divert maximum water for power, and maintain the flow of water over both the American and Horseshoe Falls as regulated by treaty. Required flow over the falls during the tourist season is a minimum of 100,000 cfs during the day and 50,000 cfs during night hours. At other times of the year, the minimum round-the-clock flow is 50,000 cfs.

Excavations along the U. S. and Canadian flanks of the horseshoe-shaped notch will improve the distribution of water flowing over the precipice, permitting a heavier curtain of water to fall over both extremities of the crest. This will take



Excavations, shown in outline, will divert some water from the center of the notch to slow the rate of erosion. Fills will eliminate incidental falls at both extremities.

To determine effects of proposed construction, Niagara River flow was studied on this hydraulic model built by the U. S. Army Corps of Engineers in Vicksburg, Miss. Results were checked with findings made on a Canadian model of the falls.

A helicopter, hovering over the brink of Horseshoe Falls, drops a lead line into the Niagara current to make an accurate sounding of the river. As the weight reaches bottom, surveyors on shore train transits on the target and take readings.

Niagara Remedial Project

Recommended excavation and fill areas on the Canadian flank. When the project is completed, water will flow more swiftly in the excavated areas, creating an even curtain of water over the crest. Landscaped fills will give tourists a new point from which to view the falls.

care of the denuded stretches which have appeared at the edges of the crest near Table Rock, on the Canadian side, and near Goat Island, which separates the Horseshoe and American Falls. These straggly areas are the result of erosion which has made the notch a more pronounced horseshoe in shape and created an uneven flow of water along the rim of the precipice. Fills placed here will do away with incidental flows over the extremities of the crest. When completed, they will be fenced and landscaped, preserving the natural beauty of the falls and offering tourists a vantage point from which to view the cascades.

Swift Erosion

All this work will help to check the rate of erosion which has far outstripped the estimated rate. The rush of water has lopped 1,300 feet off the crest of the Candian falls since it was described by a French missionary, 275 years ago. A large portion of the crest was torn away between 1678 and 1835. In the latter year, two Scottish clergymen visited the area and made one of the earliest suggestions that erosion be checked.

Serious studies aimed at preserving the falls began in 1905. The erosion problem gained more prominence when, in 1931, a mass of material about 150 feet wide and 150 to 200 feet deep crashed from the edge of the crest. Another break of about the same size occurred between the center of Horseshoe Falls and the Canadian shore in 1934.

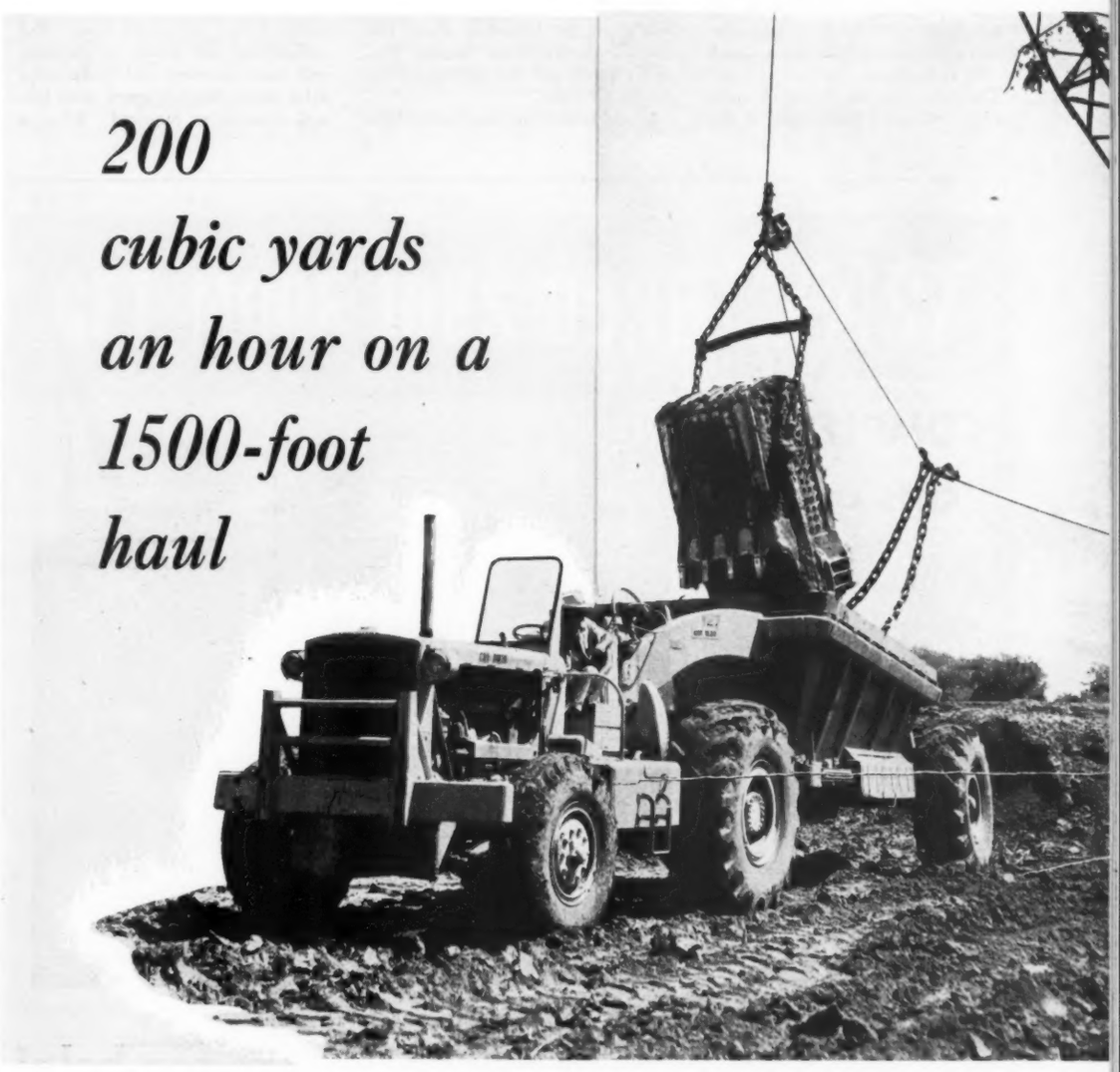
It was not until 1942 that Canada and the United States decided to act, and the move at this point was, to some extent, dictated by the war emergency. A submerged weir was built on the Canadian side of the river about 1½ miles upstream from the falls between 1942 and 1944, allowing Ontario Hydro to add more horsepower to its system. This weir also helps prevent ice accumulations in the river, such as swept away Honeymoon Bridge in 1938.

Built in the swift water above the rapids, this facility extends about 1,700 feet towards the U. S. shore from a point about 200 feet distant from the Canadian shore. It is a rock fill, constructed of huge chunks which weigh up to 8 tons. Lateral diversion of the water through gaps at each end maintains an ample supply of water for the downstream power plants. As a result of its construction, flow over the American Falls was increased, under average flow conditions, by about 6,000 cfs.

As the benefits of the weir became more apparent, similar construction was considered and the Niagara Diversion Treaty of 1950 was negotiated. The development of detailed plans and specifications in both countries began after the remedial plan was approved last July. Play-

(Continued on next page)

200 cubic yards an hour on a 1500-foot haul



Cat® DW20 Tractors and W20 Wagons are key units in the earthmoving spread of Geo. Bennett Construction Co., Kansas City, Kansas.

Loaded by the dragline, one of these machines handles 18 cubic yards of material and makes 11 to 12 quarter-mile round trips to the fill per hour. On a construction job near Turner, Kansas, three DW20-W20 units moved 25,584 yards of earth in five working days.

The Bennett Co. also has Caterpillar DW21s, D8s, D7s and Scrapers in its big yellow fleet. Mr. Bennett says: "I have been using Cat machines since 1920. They've been tough and rugged and have held up better than any competitive product I know of."

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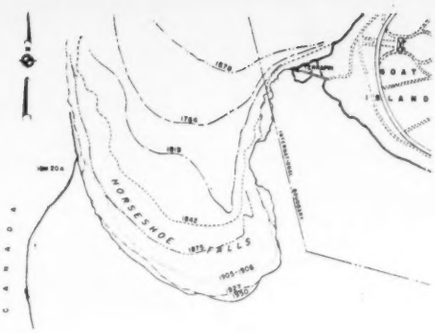
(Continued from preceding page)

ing a large part in the program was the fact that both the Niagara Parks Commission and the Niagara Frontier State Park Commission, Canadian and U. S. agencies respectively, have expended millions of dollars to develop the area as a tourist attraction.

Control Facility

The first cofferdam sections for the control structure were placed in December by Canadian Vickers, Ltd., Montreal. This organization was awarded the $1,813,149 contract for the 13 bascule-type gates which will control the water level in the Chippawa-Grass Island Pool at the head of the cascades.

The entire control structure, costing an estimated $14,500,000, is the most expensive item in the $17,536,000 job. It will extend about 1,550 feet from the Canadian shore into the Chippawa-Grass Island Pool about a mile and half upstream from Horseshoe Falls.



Lines show how the horseshoe outline of the Canadian Falls has become more accentuated. Between 1679 and 1950, its crestline has receded 1,300 feet.

Specially designed steel cofferdams and heavy concrete anchoring blocks will extend into the swiftly flowing water in this part of the river. The cofferdams, set down in sections, will have up-river and down-river sides about 200 feet apart, with lateral closures as required. When a section of the permanent control structure is completed, the next cofferdam will be built riverward. As the facility is completed, the arms of existing cofferdam sections will be removed. This process will be continued until the 13-gate structure is completed. A permanent access road from the Canadian shore will be used to transport materials and equipment to the job site.

This contract also provides for about 64,000 cubic yards of excavation along the Canadian flank of the falls and a crest fill extending about 100 feet from the shore. This work will be undertaken after the fill on the U. S. side of the river is in place.

U. S. Crest Fill

The crest fill on the Goat Island side of the river requires the removal of about 24,000 cubic yards of rock. Excavation will cover about 5½ acres and will vary in depth from 3 feet minimum to 6 feet maximum. The fill will run along the crest line 300 feet from Goat Island, then extend upstream about 300 feet to blend with the existing shoreline.

When the excavation and fill are finished on the U. S. side sometime next summer, Canada will excavate and fill on the opposite side of the crest. An area of about 8 acres will be excavated to an average depth of 4½ feet. The deepest cuts will run to more than 9 feet. About 64,000 cubic yards of rock will be removed from an area which extends from the crest of the falls about 1,200 feet upstream. The width of the excavation will run from 500 feet at the bank of the falls and narrow to 200 feet some distance upstream.

In addition to the Canadian excavation, a triangular area 100 feet long at the crest, 100 feet upstream, and having the shoreline as its third side, will be filled with rock and enclosed by a concrete retaining wall.

By staggering the excavation and fill work, cofferdams will not choke the flow of water to the falls. While the job is being done, the water will be controlled so that flow conditions will be satisfactory at the head of Goat Island and in the vicinity of the Three Sisters Islands.

River Surveys

Behind the construction now going on at the falls is a period of study and investigation, extending over a considerable period, which supplied information vital to the remedial program. Engineers from the U. S.

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and Canada, working in close liaison for the past several years, conducted hazardous river surveys to compile data which was used in testing scale models of the remedial works.

Surveys of the water surface and riverbed were so difficult that conventional techniques had to be discarded. In this wild stretch of the Niagara, the river's width and its slope of 50 feet in less than a mile, coupled with the high velocity of the water, called for the development of new methods to probe the waters of the cascades. Field parties used a helicopter and meteorological dirigible-shaped balloons called kytoons to gather data in what they dubbed "Operation Sky-Hook".

At the cascades, sounding weights were suspended from a helicopter which hovered above the crest of the falls until surveyors obtained needed information. But use of a helicopter was not practicable in measuring the surface elevation of the water in the cascades because of the trees along the shoreline and the narrow channel along Goat Island. Thus "Operation Searchlight" evolved. An 800,000,000-candlepower searchlight was directed over the crest of Horseshoe Falls and the cascades and, by triangulation of points on the water reflections of the searchlight beams, together with other computations, engineers were able to determine water surface elevations.

Testing With Miniature Model

To verify their findings, engineers built two models of the Niagara, one in the U. S. and one in Canada. Each model is capable of simulating any given river flow for past, present, or future. Miniature remedial works can be inserted in the models, allowing the river area to be studied under a wide range of conditions.

The U. S. model was constructed by the U. S. Army Corps of Engineers at Vicksburg, Miss. The model, with a horizontal scale of 360 feet to one foot, is 260 feet long and has a maximum width of 125 feet. This model includes the Niagara River area up to Lake Erie, so that tests can determine the effects of remedial works in the upper reaches of the Niagara as well as at the falls.

The Canadian model, built by Ontario Hydro at Islington, Ontario, on a larger scale, facilitates the measurement of river flow. It includes an area which extends to the downstream tip of Grand Island. The model is 95 feet long, 37 feet wide, and about 4 feet high, and is built to a scale of 250 feet to one foot horizontally and 50 feet to one foot vertically.

These models, which Ontario Hydro estimates have saved more than five million dollars on the project, will continue to be used as construction goes ahead. Already the model at Islington has played an important part in determining the design and location of intake structures for the Sir Adam Beck Niagara Generating Station No. 2 which is scheduled to go into operation this year. Additional knowledge of the Niagara currents is expected to benefit the electric utilities on both sides of the river in undertaking redevelopment programs.

Personnel

The United States' share of the remedial work is being done by the U. S. Army Corps of Engineers, and the Canadian Agency appointed to carry on construction is the Hydro-Electric Power Commission of Ontario. Coordinating the work of both agencies until recently was the International Niagara Falls Engineering Board, which was established by the International Joint Commission. This body has since been replaced by the International Niagara Board of Control, which has supervision over the design and construction of the remedial works.

Colonel W. P. Trower, corps division engineer, Great Lakes Division, Chicago, is chairman of the U. S. Section of the Niagara Board of Control. Colonel P. R. Garges, district engineer, Buffalo District, is responsible for construction on the U. S. side of the falls. THE END

Responsible for construction on the U. S. side of the falls is Col. Philip R. Garges, district engineer, U. S. Army Corps of Engineers, Buffalo, N. Y.

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By JOSEPH R. PROCTOR, JR.,
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Cut Costs and Prices With Good Form Design

Investigation and planning for concrete work pay off in a coordinated and economical job

THE TREND TOWARD more rigidly controlled specifications, coupled with sharper competitive bidding, is making it imperative that contractors use every means to develop cost-saving practices. The science of concrete design today entails an exacting operation, with precise quality tests and controls. While formwork has also progressed, it still does not seem to be widely recognized as an area in which substantial savings can be made.

Simplicity and ease of erection are being demanded in forms today—as is evidenced by the number of specialty manufacturers selling patented forms and accessories. What is not fully understood is that efficient formwork, whether of the patented or tailor-made type, is only as good as the over-all design of the job. The success of the form depends on the designer's ability to evaluate and plan for each of a job's many factors.

Advance planning not only eliminates confusion and delay in the field—where it is most costly—but provides an opportunity to study each detail in the light of other factors. Even the most insignificant detail should be planned in advance.

A number of points can be used as a guide in planning form structures. Items considered here are outlined in an accompanying check list.

While each point will not pertain to every situation, safety is a common factor in all projects. Inadequate form design in recent years has resulted in tragic accidents. The current high price of material and the low resale value of formwork make it necessary that forms give maximum performance at a minimum of cost. But these considerations, and the fact that forms are temporary structures, still do not obviate the need for structural analysis.

Design Starts Early

Form design begins when the plans are first studied and the job sequence determined. The total volume of concrete to be poured and the job schedule dictate the daily rate of pouring. If the job has a batch plant already in operation, its capacity may influence the rate at which concrete can be poured—and thus the size of the form. Form size is also influenced by the quantity of concrete structure for which a standard size may be employed. Slight modifications are sometimes feasible, as in the case where a battered bridge pier can use a standard set of forms requiring only slight changes for successive lifts. Care must also be taken that a form is not so unwieldy

19 mph speed on rubber

GETS MORE WORK DONE

Have you ever figured how much time is lost on your job when crawler-scrapers work your long or medium hauls . . . or when scrapers have to wait for slow, cumbersome pushers to position . . . or on the slow return of crawler-dozers?

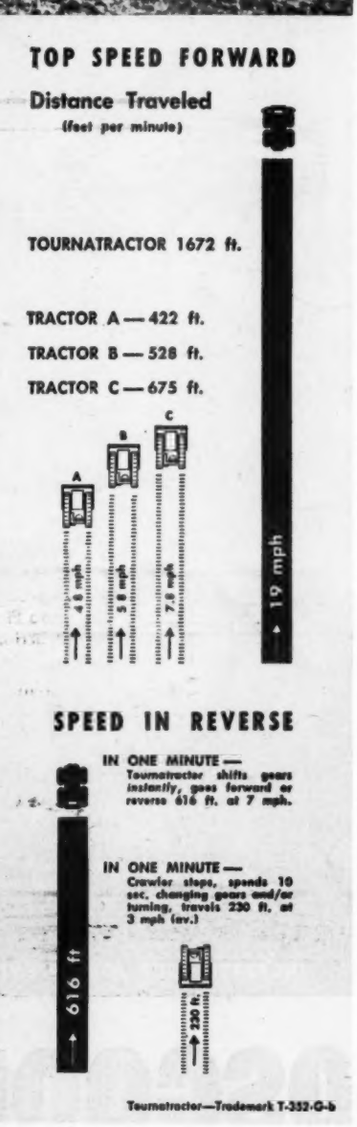
Much of this wasted profit-cutting time can be eliminated by Tournatractor! This 19 mph rubber-tired unit "runs" instead of crawls . . . gets more work done on pushing, pulling *and* dozing jobs. Here's why . . .

Travels 100 ft. to crawler's 42

Tournatractor's top forward speed is 3 to 4 times greater than the top of most crawlers. When push-loading or dozing, Tournatractor travels 100 feet forward in second gear (3.7 mph) while 3 of the leading competitive crawlers move only 32, 40, and 42 feet. In one minute, on towing applications, Tournatractor travels 1,672 ft. in fourth gear (19 mph), while the same crawlers, in top gear, move only 422, 528, and 675 ft. And, when traveling job-to-job, of course there's no comparison. Rubber-tired Tournatractor goes anywhere — over paved highways or across country under its own power at 19 mph . . . requires no trailer, loading or unloading, no blocking, no planking.

Cuts deadhead time, 2½-to-1

High reverse speeds are a very important time-saving advantage, too, because nearly 50% of your working cycle on many jobs is spent backing up. Tournatractor's 8 mph reverse cuts your deadhead cycle time by about 2½-to-1 . . . lets you use saved minutes *productively*. You position at the touch of an electric steering switch. You shift gears at the flick of a finger. There are no bulky levers to tug . . . no clutch to work. Total result: more work done with less fatigue, *and at lowest net cost.* See your LeTourneau-Westinghouse Distributor for all the facts.



LeTourneau-Westinghouse Company
PEORIA, ILLINOIS

as to cause exorbitant erection costs.

Frequently, the architect will indicate suggested construction joints on his drawings and detail the reinforcing steel accordingly. If changes here will result in a saving of time or money, a deviation request may be granted. The savings, however, should be large enough to warrant changing the drawings and the bill for material for resteeling. And the new construction joints should not greatly increase resteel fabrication costs or shoring expense.

With construction joints located so that a maximum advantage is gained from a standard form panel, the sequence of pouring operations can be outlined. The number of panels for forms can be selected to insure a continuous operation that is consistent with forming time and required aging. If space is limited and the form has to be constructed in one or more sections, the division must be considered in all subsequent design procedures.

After the general type and size of the form has been decided, sound engineering principles should be brought to bear on the design of the main structural elements. Considering the use of materials on hand, when there are choices, is important. For instance, if large quantities of 2x4 studs are available, it may prove more economical to use them, spaced closer together, than to purchase 2x6's. Spacing of studs should be correlated with the size of the form liner to minimize cutting. At this point, consideration should also be given to the requirements of staggering the panels to eliminate unnecessary weakening.

In spacing tie rods and wales, the basic factor to be considered is the rate of pour, for the period prior to the initial set is the period of maximum pressure. Each increment should be considered alone. A light column that can be poured in less than an hour decreases in pressure from the bottom to the top, so that vertical spacing of tie rods, or in this case column clamps, varies proportionately. In the case of a high wall poured at 4 feet per hour, the prime consideration should be the 4-foot increment.

Other features in the structure that affect the spacing, such as locations of haunches, keyways, and other inserts, should also be con-

(*Continued on next page*)

CHECK LIST FOR FORM DESIGN ▶

GENERAL PLAN

Size and type of form construction depend on:
- time in which job must be completed
- rate of pour and batch-plant capacity
- total amount to be poured and form re-use
- permissible construction joints
- pour sequence as defined by resteel layout
- facilities for layout, fabrication, and handling

GENERAL DESIGN—Consider size of studs and wales, liner thickness, material on hand, and modular spacing

Tie rod, stud, and wale spacing depend on:
- rate of pour
- location of haunches, keyways, other inserts
- attaching form to previously poured concrete
- connections of more than one section

Size of tie rod depends on:
- strength required
- thickness of concrete
- size of studs, wales, and liner

Spacer requirements, internal or external:
- architect's specifications
- provisions for knocking out spacers

DETAILS OF DESIGN:
- reglet design
- windows for vibrating or cleanout
- type of screeds to be used
- templates for conduit or other sections
- requirements of concrete crews
- methods of joining form sections
- details for bulkheads
- design for handling

STRIPPING FORMS
- sequence for stripping
- space for wedges, crush plates, etc.
- breakaway lines for haunches, irregularities
- separate sections for weaker elements

SECURING FORMS

Consider all stresses involved in:
- wind
- weight of form
- weight of resteel
- weight of concrete
- weight of concrete crews and equipment

Consider nonroutine stresses

Consider use of structures of work in progress

FLECO ROCK RAKE SORTS 175 YARDS OF ROCK RIPRAP AN HOUR

Speeds Construction Work on Tuttle Creek Dam

Riprap on the upstream slope of Tuttle Creek Dam will be a 10-foot rock fill. Rock is delivered to the project mixed with clay and undersize rock and shale. Sorting of this material has been assigned to a Fleco Rock Rake by George Bennett Construction Co., contractors on the first stage of the project.

The heat-treated, cast-alloy steel teeth of the Rake crowds into the dumped fill material under the steady push of a Cat D8 Tractor. Undersized rock and clay sifts through the teeth, while acceptable material rolls down the slope. The curved teeth give the load a rolling action instead of pushing it, cutting tractor work-effort and increasing load capacity. The Fleco Rake handles 3500 cubic yards of the material in a 20-hour shift.

With a Fleco Rock Rake, you can take on the toughest rock job with complete assurance of production and stand-up ability. Fleco Rakes are built for all track-type tractors and are interchangeable with 'dozer blades.

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ROOT RAKES • ROCK RAKES • BRUSH RAKES • STUMPERS • ROOT CUTTERS • TREE CUTTERS • TREEDOZERS • UNDERCUTTERS • V-PLANES

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(Continued from preceding page)

sidered so that there is no conflict. Prior consideration of these aspects will prevent confusion and loss of time in the field. Where concrete is poured in successive lifts, the top tie rod on each form should be located so that it will secure the form for the next lift. (See figure 1.) Similar care should be given to tie-rod spacing where pours are connected by a vertical construction joint.

Design requirements will determine the capacity of the tie rod; while the thickness of the concrete and the dimensions of studs, wales, and liner will dictate its length.

Where the form requires spacers to maintain rigidity, the type employed should be adequately studied and evaluated in advance. Precast-concrete spacers, to be placed inside a large wall form, can be quickly and economically made up. If the wall is for a structure containing water, however, the architect-engineer may object unless adequate measures are outlined for knocking the spacers out during pouring operations. On a small form, spacers can be attached to the outside of the form with leftover lumber or, in some cases, may be incorporated into templates for conduit, anchor bolts, or other inserts.

It is at this point that the form is sometimes sent to the field for fabrication. But for maximum performance, all details must be analyzed and planned with the same care given the more general features of the form. The seemingly insignificant matter of reglets where a wall meets a slab, for instance, can pose real problems for the erecting crew. A large form is somewhat awkward to handle, and the relatively small projection on the lower edge may break off. In many cases, it is advisable to make this separately, attaching it as the form is placed. (See figure 2.) This also simplifies the stripping operation. And when such a small detail is built separately, it is more easily replaced if it

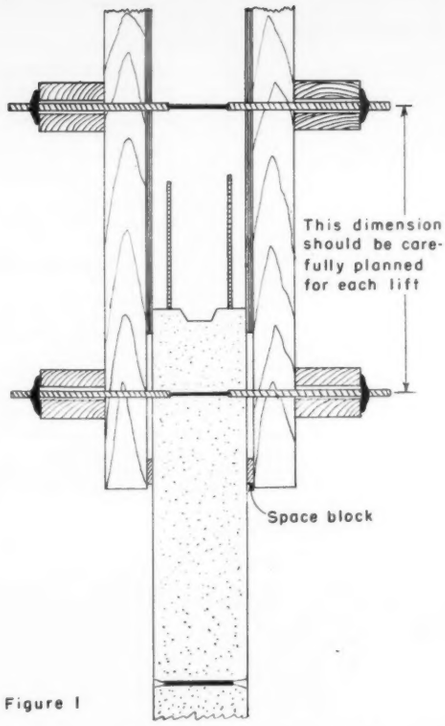


Figure 1

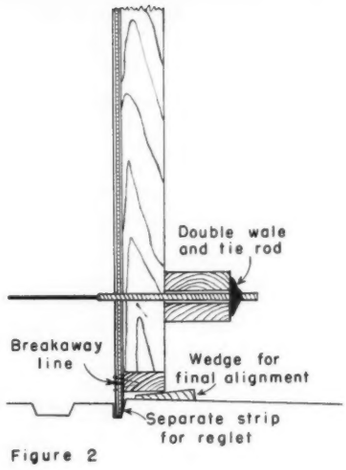
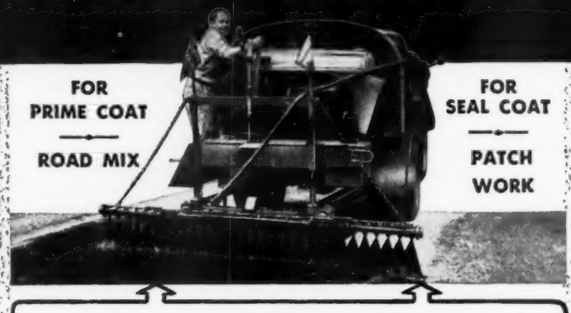


Figure 2

STANDARD STEEL PRESSURE DISTRIBUTOR



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✓25% More Asphalt shot per day! Faster loading! No delays Starting! Instant cleaning at end of run! These are facts known to every operator of **Standard Steel Pressure Distributors!** Why? Because of the simplified piping in this equipment! The full circulating spray bar contains submerged valves which are quickly heated and remain uniformly hot at each point of pouring. The throw of a single lever opens and closes all valves instantly. Every inch of the spray bar delivers precisely the same material output—lightest or heaviest bituminous material. And there are 12 other special features that make this equipment outstanding in performance. Write for catalog 424 today for complete details.

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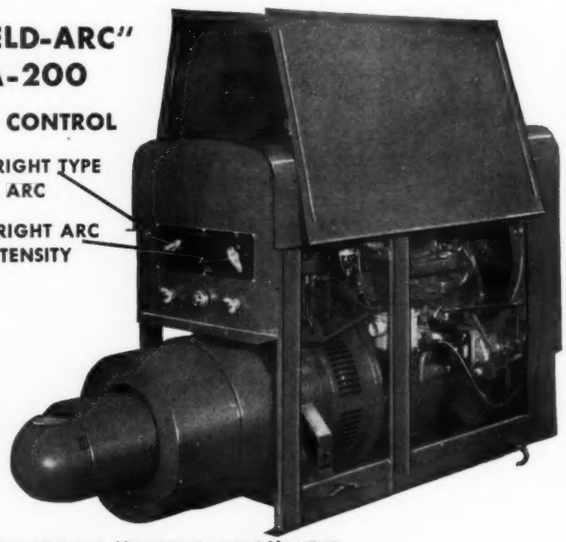

WITH LINCOLN "SHIELD-ARC" YOU

PICK EXACT ARC TO CUT WELDING COSTS

Here's why more Lincoln SA-200 welders are in use today than any other engine-driven welder in the world:

FAST, SIMPLE DUAL CONTROL *assures right type* arc and *right arc intensity* for every job. This means that operator can suit the arc to the job every time for flat, vertical or overhead welding.

COMPACT DESIGN provides long, dependable service, low-cost operation, highest quality welding in hardsurfacing and maintenance applications.

SEE FOR YOURSELF. Compare "Shield-Arc's" money saving features and low cost. Bulletin 1337, giving cost-cutting details, is available by writing on your letterhead.

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happens to be broken during stripping operations.

Proper location of openings or windows for cleaning out or vibrating will prevent unnecessary weakening of the form and provide speed in filling in when needed. If the type of screeds to be employed is determined at this time, they can sometimes be built into the form so that their more costly installation during erection is avoided. Screeds should be simple in design so that they can be removed easily before finishing operations.

Templates for anchor bolts, conduits, and similar items can be planned with an eye for economy. For instance, they can double as top spacers for the form. In providing templates, alternatives may be used to avoid congestion in the pouring area. Here, the needs of the concrete crews are of paramount importance since overcrowding in this area will push placing costs far out of line.

Provision for space or platforms for concrete crews can also be made. This is particularly necessary where space is limited and where platforms and catwalks can be incorporated into the form structure. In any event, such additional structures must be designed carefully so that danger to personnel—as well as to the form—is avoided.

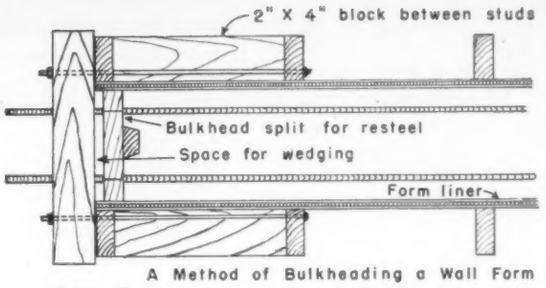
Where more than one section makes up the form for a single pour, a simple and effective method of joining the sections must be devised so that the form can be assembled and stripped with maximum speed and efficiency. At the same time, the method must conform to other features of the design, such as uniform spacing of tie rods, to afford a strength that is consistent with that of the form.

Bulkheads

The matter of bulkheads between successive pours is often left to the men in the field, and this is permissible on a small job. On a job of considerable size or with a repetition of similar pours, a little preliminary thought can be of great value. The form, as designed up to this point, is an important and expensive item. The method used for bulkheading may have a considerable effect on the re-usability of the form. A secure and accurate bulkhead, simply attached, will afford savings in erection and stripping costs and will eliminate another danger to the form. In many cases, the use of a split bulkhead to accommodate resteel is advisable. Notches cut along the split lines facilitate the placing of resteel and aid immeasurably in stripping. (See figure 3.)

The form has now been designed on a preliminary basis, but there still remains the problem of handling. If fabricated outside the immediate vicinity of the pour, it must be lifted, transported, unloaded, and erected. Consideration must be given to all the stresses to be developed during handling. A thorough study of the need for reinforcing and lifting devices can be made. The use of a specially designed strongback may prove practical on a job consisting of numerous identical pours because it can eliminate built-in provisions for the unusual stresses of handling. A set schedule should be defined and carefully implemented in the field. On a recent concrete job, a large wall form was thoroughly planned and designed, complete to a special set of lifting hooks for handling. But in transporting the form to the job site, the rigging crew completely ignored the lifting hooks and merely wrapped a long choker around the form. When the form was lifted, the cable bit into the wood and did considerable damage to the form which, even before erection, had cost more than $1,000.

Each phase of the total design, correlated with all the other phases, will result in a job that is well integrated. A substantial revision in some basic design features may have to be made, but throughout the entire procedure the designer's foremost thought should be of the stripping requirements. The stripping sequence will dictate how sections are to be joined, how wales are to be placed, and a number of other considerations. Provisions for wedges, crush plates, and other devices to provide space for stripping tools will influence the finished design. Haunches, offsets, and other minor irregularities may well require breakaway lines to allow the main form to come off first and by itself. Construction of reglets or haunches as separate items will allow them to be handled better and with less danger of damage. If these sections are damaged, they can be replaced more easily than if they were an

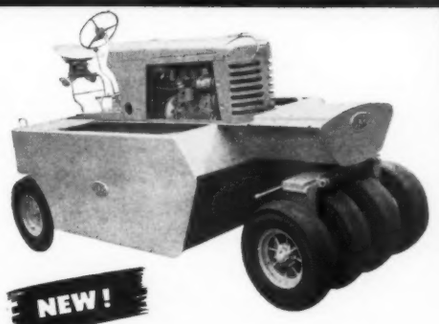


A Method of Bulkheading a Wall Form

Figure 3

TAMPO for Efficient COMPACTION

COMPACTORS . . . SHEEPSFOOT & PNEUMATIC ROLLERS



NEW!

SELF PROPELLED PNEUMATIC

★ 9 wheels, 72" of solid rolling width coverage
★ Variable wheel loads from 680 to 2000 lbs.
★ Ground pressure 172 to 250 lbs. per linear inch
★ Working speeds 2½ & 4½ M.P.H. forward & reverse
★ 31 H.P., 4 cylinders, 129 cu. in. displacement
★ Hydraulic steering ★ Water Sprinkling System

VERSATILE

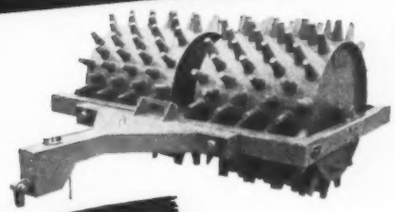
20 & 50 TON COMPACTORS

★ Variable wheel loads from 1250 to 25000 lbs.
★ Oscillating axles for flexibility, uniform compaction
★ 50 ton—4 tires 18.00x25—24 ply
★ 20 ton—6 tires 11.00x20—12 ply
★ For rolling to high density on heavy fills
★ Maneuverable, efficient, compact more yds. per hour

SMOOTH

PNEUMATIC TIRED ROLLER

★ Two models: 9-wheel with 60" rolling width and 13-wheel with 84" rolling width.
★ Oscillating Axles for uniform compaction and longer tire life.
★ Most versatile roller ever used on road or airfield construction. Ground pressure per linear inch of rolling width can be varied from 47 to 325 lbs. Can be pulled by any average size, pneumatic-tired tractor at speeds to 12 M.P.H.



FLEXIBLE

SHEEPSFOOT ROLLERS

★ 40" and 60" Drum Diameters.
★ Independent oscillation of each drum
★ Spring-in-tongue absorbs shock.
★ Roller bearings adjustable from outside. NO SHIMS to insert.
★ Rugged and easy to pull.

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1146 W. Laurel Street • San Antonio, Texas • P. O. Box 2340 • Tel. P-9171

integral part of the form. A less obvious advantage is that the over-all form can be made more standardized.

Erection

With plans and design entirely worked out, the methods to be used in holding the form in position should next occupy the designer's attention. Thought can be directed to all the stresses that may be developed from the time the form is erected until the time it is stripped. In this category will fall wind force on vertical planes, weight of materials in the form, weight of resteel and concrete, and weight of the maximum number of men and pieces of equipment working on the form at any one time. Provision must also be made for nonroutine or accidental stresses such as a concrete bucket striking the form or hitting a shore.

Considerable imagination can be shown in devising methods of shoring, bracing, and anchoring. In a recent installation involving a large wall form, cables were attached to the form and anchored in the ground with concrete deadmen. A large amount of lean concrete used as backfill was readily available for this purpose. An earth auger bored the required number of holes about 4 feet deep; these were filled with lean concrete, and a resteel hairpin was placed in the fresh concrete so that about 2 inches of the loop projected above the surface. These deadmen were easily removed by a bulldozer when the wall was completed, since they had been placed on a line that was to be excavated for a large-diameter water line.

Careful study of existing structures, as well as of work in progress at the time the form is to be used, may provide ideas for securing the formwork. Tie rods placed strategically in one pour may provide excellent anchorage for the forms in the next.

There is no substitute for the careful planning of concreting operations, which in many instances comprise the bulk of the contract price. Although he may have assistance in working out details, the over-all plan for formwork remains the sole responsibility of the general superintendent, for it is he who must plan the entire job sequence; organize the materials, men, and equipment; and come up with a smooth-running and economical job. THE END

Booklet on Snow Removal

Pamphlet No. 9-3R in the Highway Research Board's series, "Current Road Problems", has been issued in a third revised edition. The booklet deals with recommended practice for snow removal and treatment of icy pavements.

The publication represents a study of prevailing practices in snow removal and presents recommendations for organization, equipment, and practice in clearing highways. The section on ice prevention and removal has been amplified. Types of equipment and materials, as well as various methods, are discussed and illustrated.

The pamphlet is priced at 30 cents and may be ordered from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Rotating Broom Sweeps Into Its Own Bucket

■ A combination sweeping broom and bucket for Hough Payloaders is announced by the sweeper division of Clark-Wilcox Co., 118 Western Ave., Boston 34, Mass. The broom of the hydraulically controlled unit sweeps directly into an attached bucket, and the refuse is then dumped easily into a truck. The Load Sweeper is suitable for construction work such as sweeping up peastone and can be used for a variety of surface treatment jobs.

An important feature is that the sweeping combination operates in either direction, eliminating turns on busy streets. The sweeper is controlled by a three-way hydraulic system which permits the broom to be rotated in either direction. The reversible broom rotation permits sweeping of material into piles, into a trench, or off the highway onto shoulders. The unit cleans close to the curb.

The Load Sweeper broom and bucket.

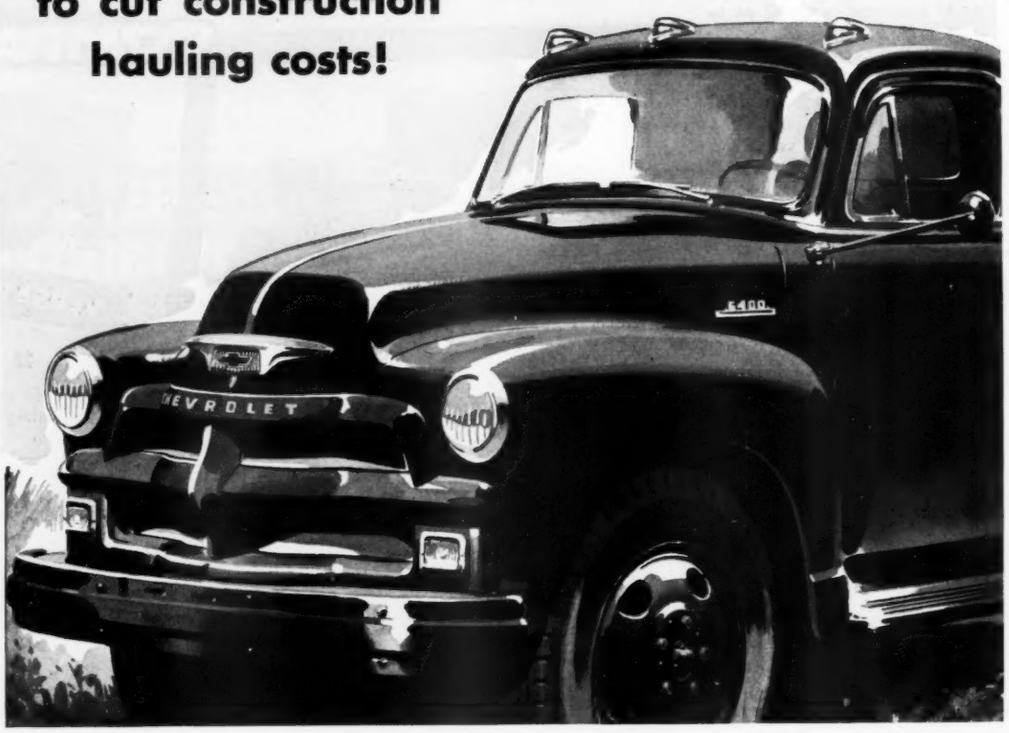
The Load Sweeper comes in four sizes ranging from 48 to 96 inches in width for use with all models of Hough Payloaders. A simple design permits fast removal or installation.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 351.

Film on Motor Graders

A new full-color sound film on Adams motor graders has been released by J. D. Adams Mfg. Co., Indianapolis, Ind. Showings of the 20-minute movie may be arranged with local Adams dealers.

Powered and built to cut construction hauling costs!



You save time on the job — and you save on gasoline besides — with the most rugged, most powerful Advance-Design trucks ever built!

You can speed up construction hauling schedules and cut down your costs at the same time with new heavy-duty Chevrolet trucks. They bring you extra reserves of power—time-saving acceleration and hill-climbing ability—in the mighty "Jobmaster 261" engine*. It's the most powerful Chevrolet truck engine ever built—and it delivers more operating economy, too!

NEW DRIVING EASE

Here's another advantage you get with the new "Jobmaster 261" engine. Since the driver commands more power at all engine speeds, there's less need for gearshifting on grades . . . fewer downshifts in traffic.

NEW DRIVER COMFORT

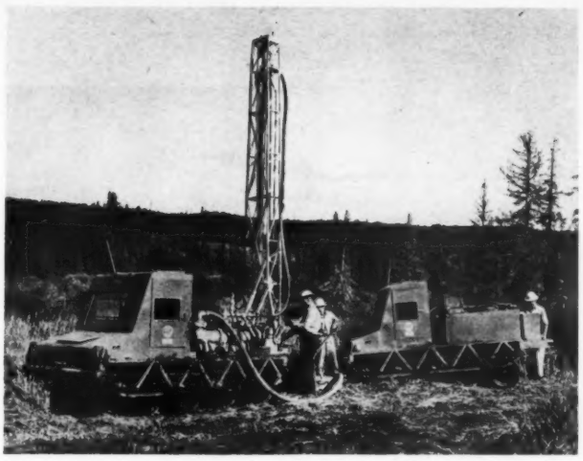
The new Comfortmaster cab has everything a truck driver wants—new one-piece curved windshield; new, more convenient instrument panel and controls. And the new Ride Control Seat* offers the last word in driver comfort. Seat cushion and back move as a unit to eliminate back-rubbing. Now's a good time to talk trucks with your Chevrolet dealer! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCKS

Tandem-Track Tractor Can Move Over Surface Of Boggy Terrain

■ Details have been released on a new tandem-track crawler tractor designed to travel over muskeg. The tractor, developed by the Gulf Oil Corp., and built by Bombardier Snowmobile, Ltd., Valcourt, Quebec, travels on two 29-inch-wide tracks and exerts a tread bearing pressure of 1½ psi fully loaded. By way of comparison, the ground bearing pressure exerted by a jeep is 50 to 100 psi, and that of a man is 5 to 6 psi.

Now offered for general sale, the tractor was originally designed to expedite oil-exploration work in northern Canada. Much of this area is thickly overgrown with muskeg, a crusty matting which may break through under the weight of a vehicle or a man. In winter, the muskeg freezes to an unpredictable depth with thin spots here and there.



This tandem-track crawler tractor was developed by the Gulf Oil Corp. to travel over Canadian muskeg bog, a treacherous water-soaked terrain.

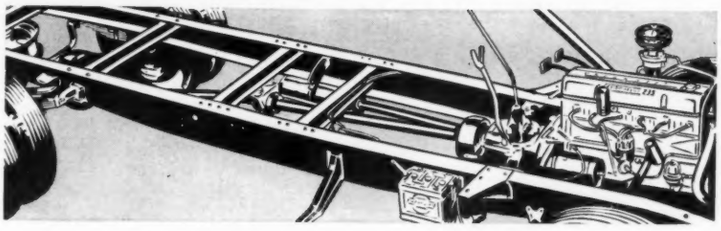
The marsh buggy, developed earlier by Gulf to travel over the swampy lands of the southern states, was too large for the trails in this area, and its balloon-like tires proved too vulnerable to jagged timber. It was found that the new "muskeg" tractor could venture on thinner ground surfaces than any other land vehicle tried by the oil company.

Load capacity of the vehicle is 2,500 pounds, carried on a 5,000-pound chassis. Four bodies were designed for the unit, and special equipment had to be developed to take full advantage of its payload. The bodies included a seismic drill rig, a water unit to supply drilling needs and camp water, a drilling unit, and a general utility and supply unit.

A Chrysler 116-hp engine drives the tractor. Power is transmitted through double sprockets on each side of the unit to the tractor treads. These run on double tandem wheels. Two pairs are in front and two in back, making 16 wheels in all. Steering is done through differential track-speed control.

For further information write to Bombardier, or use the Request Card at page 18. Circle No. 457.

NEW CHEVROLET TRUCKS



New, stronger drive line
New, stronger drive lines in all heavy-duty models mean extra stamina . . . longer truck life.

New frame ruggedness
More rigid frames resist twisting and weaving in big-load, off-the-road construction hauling.

MOST TRUSTWORTHY TRUCKS ON ANY JOB!

Plus all these Advance-Design truck features: THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra-heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. SYNCHRO-MESH TRANSMISSION—DIAPHRAGM SPRING CLUTCH—HYPOID REAR AXLE—TWIN-ACTION REAR WHEEL BRAKES on heavy-duty models. DUAL-SHOE PARKING BRAKE on heavy-duty models. NEW RIDE CONTROL SEAT*—NEW, ROOMIER PICKUP, STAKE AND PLATFORM BODIES—NEW COMFORTMASTER CAB—PANORAMIC WINDSHIELD—BALL GEAR STEERING—NEW ADVANCE-DESIGN STYLING.

*Optional at extra cost. Ride Control Seat is available on all cab models, "Jobmaster 261" engine on 2-ton models.

Splicing and Repair Of Conveyor Belts

■ A manual that tells how to splice and repair conveyor and elevator belting has just been announced by the B. F. Goodrich Co., Akron, Ohio. Photographs are used to illustrate the proper belt-splicing procedure. The manual describes splicing materials, tools needed, the best conditions for splicing and repair, the method of splicing cord and fabric belts, and special procedures in splicing rayon belts.

Detailed instructions for on-the-job vulcanizing of splices with portable vulcanizers are also included. The use of Quick-Lock temporary-repair material is described in detail.

A description of vulcanizing equipment and a chart showing quantities of splicing materials needed for any specific job are other features of the manual.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 379.

Book of Hydraulic Tables

A 565-page handbook, "Hydraulic Tables", in wide demand by hydraulic engineers, engineering colleges, and various government agencies, has been reprinted by the Government Printing Office.

Prepared under the direction of the Chief of Engineers, U. S. Army, the book contains 46 tables which are helpful in solving the Manning Formula for flow in open channels. Some are new tables, while others are extensions of tables in King's "Handbook of Hydraulics" and in the Bureau of Reclamation's "Hydraulic and Excavation Tables". The book, available from the Government Printing Office, Washington, D. C., costs $2.50.

Promotion: Passport to Profits

Cheyenne, Wyo., distributor conquers buyer's market with increased sales effort and good public relations

Part of the group of 130 Wyoming contractors, county commissioners, and mechanized farmers who visited the Caterpillar Tractor Co. plant at Peoria, Ill., as guests of the Wortham Machinery Co., Cheyenne, Wyo. A special train carried the men to and from the Illinois city.

AT LEAST HALF the battle in selling heavy equipment is a matter of public relations, in the opinion of W. A. Norris, Jr., who heads the distributing organization of Wortham Machinery Co., Cheyenne, Wyo. And Norris' ideas pay off, as is seen in the fact that his company had its most successful year during 1953, despite a downward business trend throughout Wyoming.

An outstanding example of Wortham's promotional program is the all-expense-paid trip to the Caterpillar Tractor Co. plant at Peoria, Ill., arranged by the Cheyenne firm last year for 130 heavy-equipment users from all parts of Wyoming. The project cost Wortham $20,000—and "was worth every cent of it", according to Norris.

A special train carried the group, made up of contractors, county commissioners, and prominent mechanized farmers, from Cheyenne to Peoria. There, while guests of Wortham, they toured the Caterpillar plant and watched the manufacturing and assembling of heavy earth-moving machinery.

"I believe every man on that trip, including myself, got a much better appreciation of how carefully heavy modern equipment is made", the Wortham executive declares. "And I think the trip emphasized what we had often told these men in our sales talks." Norris makes it plain he considers the trip good backing for Wortham's sales program.

Sales Organization

Wortham salesmen cover the entire state of Wyoming and extend their efforts to adjoining states as well. Branch offices of the company are located in Casper, Sheridan, and Rock Springs, Wyo. Both routine and new methods of selling machinery and providing service are used by a sales force of 12 men. The company has a total of 107 employees.

Wortham is an organization of young men; the average age of key personnel is 31. Norris himself looks as if he might be the president of a college fraternity rather than head of a machinery distributing firm, but he has been in the business since 1939, when he started as a parts man.

Buyer's Market

The equipment distribution business in Wyoming found itself facing a buyer's market about the middle of last year. Boysen Dam at Riverton had long been completed, and the enormous railroad grading job which Morrison-Knudsen Co., Inc., Boise, Idaho, did between Cheyenne and Laramie the previous year also was finished. There were no large construction projects under way.

In spite of the dreary market picture, Norris and his organization managed to increase business volume 15 per cent over the previous year. Believing that equipment sales are directly proportionate to sales effort, Norris boosted his sales force from 7 to 12 men. He increased his advertising quota. And the additional effort paid off despite the fact that agricultural users of heavy equipment were themselves harassed by low cattle prices, a severe drought, and increasing feed costs.

Wortham's principal line is Cater-

LENKER

AUTOMATIC LEVEL ROD

ELIMINATES ALL COMPUTATIONS IN TAKING ELEVATIONS

To Operate—

Clamp the movable band to read the elevation of the bench mark or turning point.

The rod is now ready for operation. Every reading taken, will be the elevation of the point on which the rod is held.

ACCURATE and SPEEDY

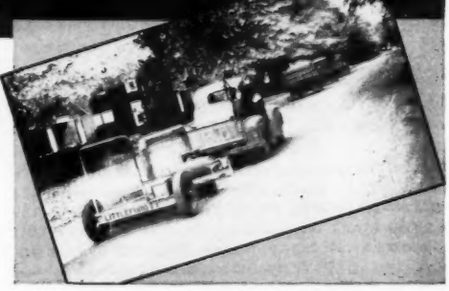
Write for circular

LENKER MANUFACTURING CO.
599 Chestnut Street, Sunbury, Pa.

The BEST for more than one reason . . . . .

- Patented Hydraulic Brush Raising and Lowering System.
- Sweeps right, left or dead center. Changeover requires 30 seconds.
- Mono-Frame Construction for lightweight easier handling.
- Adjustable Brush Tension on Road saves brush wear.

LITTLEFORD ROAD BROOMS



Littleford Road Brooms are designed to make highway sweeping a low cost job. Both the Motor Driven and Traction Driven Brooms are engineered to operate with the least amount of effort but with 100% efficiency. Hydraulic brush raising and lowering system saves wear on the brush as the right tension can be adjusted for each particular sweeping job. The whole weight of the brush does not necessarily have to rest on the road surface when sweeping. This saves Brush wear—saves money. Write for Bulletin 19.

LB LITTLEFORD
BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE - 1900
LITTLEFORD BROS., INC.,
485 E. PEARL ST., CINCINNATI 2, OHIO

The Cheyenne repair shops of the Wortham Machinery Co. are fully equipped for virtually every type of specialized repair and maintenance.

pillar and the accounts allied with that firm. The company also distributes Jaeger, Littleford, and Browning heavy equipment, and smaller items such as Thor pneumatic tools and Jaeger pumps. According to Norris, Wyoming contractors and others who use heavy equipment look to one distributor for machinery, small tools, and even supplies such as cable. As a result, the firm's stores carry such smaller items as pumps, chain saws, and tools.

On the Union Pacific railroad relocation job last year, Morrison-Knudsen covered the entire 42 miles of project in little more than a year. The project required dozens of Caterpillar tractors, scrapers, and rubber-tired hauling units; and with Wortham supplying parts on short notice, the contractor never had a piece of equipment out of commission for more than 12 hours. Wortham mechanics also do considerable repair and service upkeep work for contractors in various parts of the state.

Store Organization

Each of the stores which serves as a suboffice of the Cheyenne company has a manager and one or two salesmen, in addition to a mechanical force. These outlets carry adequate parts inventories and have well specialized equipment-repair shops, field-service trucks, and competent mechanics. The training of mechanics is such an important part of Wortham's policy that the general service manager, C. O. Skjerver, makes visits to each branch store at least once a month to bring mechanics up to date on new techniques.

"We try to make our repair work so foolproof that we can stand behind every job with pride", says Norris. "But if a mistake is made, we assume our responsibility—financial and otherwise—for the owner's benefit.

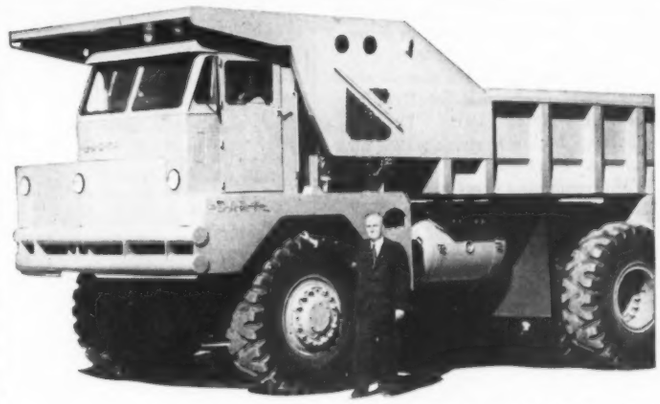
"I believe it is one of the basic responsibilities of management in this business to work for competent mechanical help and a vigorous sales program. Too, harmonious relations between equipment distributors, their customers, and the manufacturers will be increasingly important in the months to come."

Although there is emphasis on promotional work and advertising, the hard core of Wortham's business is traceable to routine sales effort—no easy task in Wyoming. The state is one of high mountains, wide plains, and scattered towns. Heavy-equipment users are not always easy to find, and the roster of contractors is not large. Wortham salesmen, therefore, must resort to considerable "brush beating" to make sales.

The salesmen are strategically located throughout the state. The towns of Torrington and Riverton have a resident salesman. In addition, a leased-wire system keeps the three branch stores in contact with the Cheyenne headquarters.

Wortham Machinery Co. was incorporated in 1931, when construction in Wyoming was a relatively new industry. The firm has grown progressively since its organization, and officials look to the

(Concluded on next page)

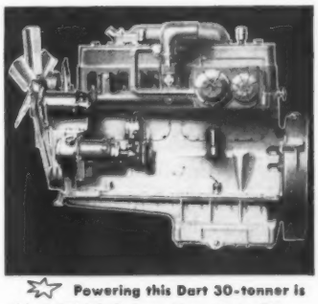


RALPH KRESS, Exec. V. P. & G. M. of Dart Truck Co., has created a heavy-duty truck of new design, Waukesha Super Duty Six powered

new design FOR HEAVY DUTY

POWERED BY WAUKESHA

Utilizing the full power of its Waukesha 6-WAKR Butane Engine for driving—the newly designed 30-ton Dart 35-SA End-Dump Truck is most unusual. All auxiliaries, including the cooling system, are driven by a smaller engine . . . a Waukesha 195-GKU. Mounting the engines amidships (centered between the wheels), and the wagon-type front axle, both exclusively Dart, give many advantages. Waukesha power means payload performance plus economy.



☆ Powering this Dart 30-tonner is this 6-WAKR Butane Super Duty Six — 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement, 290 horsepower at 1800 rpm

Super-Duty Six 1197 CU. IN. 6-WAK Series

- 6-WAK—Gasoline Engine
- ☆ 6-WAKR—Butane Engine
- 6-WAKDB—Diesel Engine
- 6-WAKDBS—Supercharged Diesel Engine

Send for Bulletins

UP TO 352 MAXIMUM HORSEPOWER

Standard or Counterbalanced Crankshafts are available. Consult Waukesha on permissible speeds for your service.

238

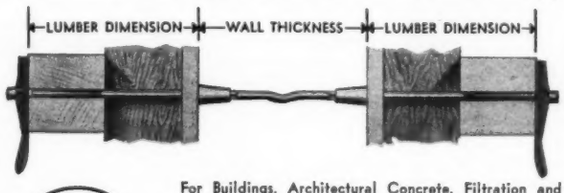
WAUKESHA MOTOR COMPANY · WAUKESHA, WIS.

NEW YORK · TULSA · LOS ANGELES

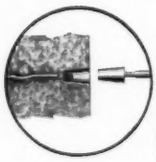
Another First for WILLIAMS—

THE WEDGE-LOCK WIRE TIE

(with ends that don't have to be thrown away)



For Buildings, Architectural Concrete, Filtration and Sewage Disposal Plants, Basements, etc.



Outer Unit will fit standard wedges; may be reattached to secure scaffolding, or to eliminate offsets at construction joints.

Inner Unit crimped to prevent turning and breaking of bond during removal of outer units and assuring watertight walls.

NO exposed ties, unbonded patches, water seepage, rust streaks or warped surfaces, no spauling. No wrenches or tools required for removal or installation.

BUT accurately spaced rigid forms, positive tie disconnection, tie bonded patch (will stand hammer test), better finish, and perfect alignment.

Write for leaflet No. 7-53

WILLIAMS FORM ENGINEERING CORP.

MAIN OFFICE — MADISON and GARDEN STS. • PHONE 5-9209 • GRAND RAPIDS 7, MICHIGAN

WESTERN OFFICE: 751 N.E. LOMBARD ST., Ph. TW-6453, PORTLAND 11, OREGON

EASTERN OFFICE: 2304 BREWERTON RD., Ph. 54-2500, SYRACUSE, N. Y.

PIONEER MANUFACTURERS OF CONCRETE FORM HARDWARE

(Continued from preceding page)

future with optimism. Like other western states, Wyoming is moving rapidly in the direction of larger population, new industries, and new markets. New oil fields have been developed, and there are reports of uranium deposits in the state.. All these facts encourage the business outlook at Wortham.

Other Wortham executives include R. E. Coyle, vice president; Adolph Sylte, general parts manager; Earl Collins, manager of the Sheridan store; W. S. Jackson, manager of the Casper branch, and W. J. Roshek, Rock Springs manager. THE END

Hensley Names Seven Dealers

Seven western distributing organizations have been named by Hensley Equipment Co., Oakland, Calif., to serve as exclusive dealers for Hensley's line of dozer rippers, brush rakes, scraper-rippers, and tractor attachments used in heavy construction.

Among the California distributors are Lowry Equipment Co., Redding; Oroville Motor Parts, Oroville; Harrison Motor Parts, Fresno; and John A. Batchelor, Los Angeles.

The remaining firms include Cal.-Ore. Machinery Co., Medford, Oreg.; J. T. Holland Co., Salt Lake City, Utah; and Hi-Way Machinery Co., Dallas, Houston, and San Antonio, Texas.

Dealers for Wooldridge Line

The Ted Henry Co., Portland, Oreg., and American Equipment Corp., Mechanicsburg, Pa., have been appointed exclusive dealers for Wooldridge earth-moving equipment in their respective territories.

The Portland organization will cover northwestern Oregon and southwestern Washington. Its shop facilities, together with field service and sales headquarters, are located at 5275 N. W. St. Helens Road.

American Equipment Corp., with headquarters at York and Allen Streets, Mechanicsburg, will serve the major portion of eastern Pennsylvania. Both companies will handle the Wooldridge line of Terra-Cobra scrapers, rippers, bulldozers, etc.

Wisconsin Dealer for Marion

Cunningham-Ortmayer Co., 2016 W. Cornell St., Milwaukee, Wis., is now handling state sales, service, and distribution for the Marion Power Shovel Co., Marion, Ohio. The dealer, handling construction, industrial, and road-building equipment and supplies, has branches in Eau Clair and Green Bay, Wis.

Heading the distributor company is Henry J. Adams. O. D. Lambeau is vice president, and John O. Schapekahm is secretary-treasurer.

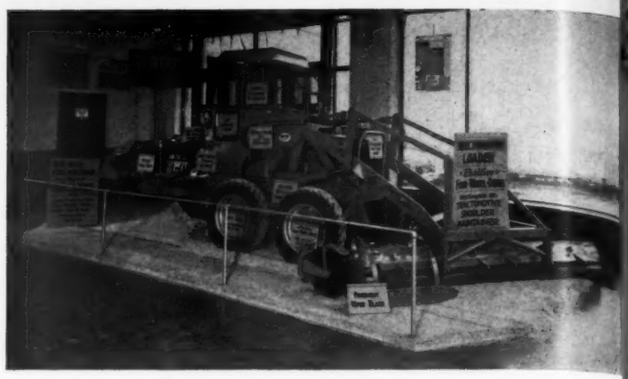
New Warner & Swasey Dealer

The appointment of Fred Malotte Machinery Co., Inc., Petersburg, Ind., as a distributor for Warner & Swasey Co., Cleveland, Ohio, has been announced. The Malotte organization, soon to open an Indianapolis office, will handle sales of Gradall construction equipment throughout 62 counties in central and southern Indiana.

Drott Tractor Safety Display

To stress the importance of good road shoulders and the need for their maintenance, the Drott Tractor Co., Inc., Milwaukee, Wis., set up a safety display in its showroom during the 1954 Wisconsin Highway Conference in that city. State, county, and township highway officials, in Milwaukee for the conference, viewed the display, part of a campaign for safe shoulders which the dealer had been conducting.

In the showroom, a strip of concrete with a shoulder dropoff alongside simulated an actual highway



Le Roi-CLEVELAND T-286 Self-propelled Dual Drill Rig — consists of two patented Le Roi-CLEVELAND air feeds and drills with air-motor booms mounted on a mobile 25-hp tractor. You can drive the T-286 anywhere and tow your Airmaster compressor as well. You get quicker setups, faster drilling, better fragmentation, and lower costs.

Le Roi-CLEVELAND Clay Digger — at work on a sewer job. Well-balanced for easy handling, these spaders pack plenty of wallop for the stiffest clay. Operators like them, because they can do more work with less effort. A one-piece, bonded, rubber buffer with split steel collars keeps out dirt and grit — makes steel changing faster.

Your air-powe
operations

Cost Less

Le Roi-CLEVELAND Paving Breakers—are packed with power to make quick work of breaking up the hardest concrete. Sizes range from 18 to 80 lbs. Protective cushion in front end assures long life. Exclusive valving provides an easy-holding action that operators like. All these features help you reduce your costs.

Le Roi-CLEVELAND Backfill Tamper—weighs only 34 lbs. Thanks to its smooth-holding qualities it can be "walked" over the fill easily. Operators can do more tamping. The major parts are made from durable drop-forgings and a built-in oil reservoir keeps wear to a minimum. Just another example of how Le Roi gives you more for your money.

LE ROI GIVES YOU MORE FOR YOUR MONEY!

More air power!
More footage!
More profits!

An Allis-Chalmers Model D motor grader with shoulder maintainer is exhibited under simulated working conditions in this Drott Tractor Co., display in Milwaukee, Wis.

condition. Here an Allis-Chalmers motor grader with attachments demonstrated how road shoulders can be rebuilt, reshaped, and maintained.

State Equipment Is Joy Dealer

Joy Mfg. Co., Pittsburgh, Pa., has appointed State Equipment Co., 642 Market St., Kingston, Pa., as distributor of Joy construction equipment for 21 counties in northeastern and central Pennsylvania. The dealership covers the entire Joy construction line which includes stationary and portable air compressors, rock drills, paving breakers, spaders, tampers, and portable hoists.

LeTourneau-Westinghouse News

Superior Equipment Co., 2221 S. 19th Ave., Phoenix, Ariz., has been named LeTourneau - Westinghouse equipment distributor for the entire state of Arizona. Plans are under way by the dealer to erect a new building.

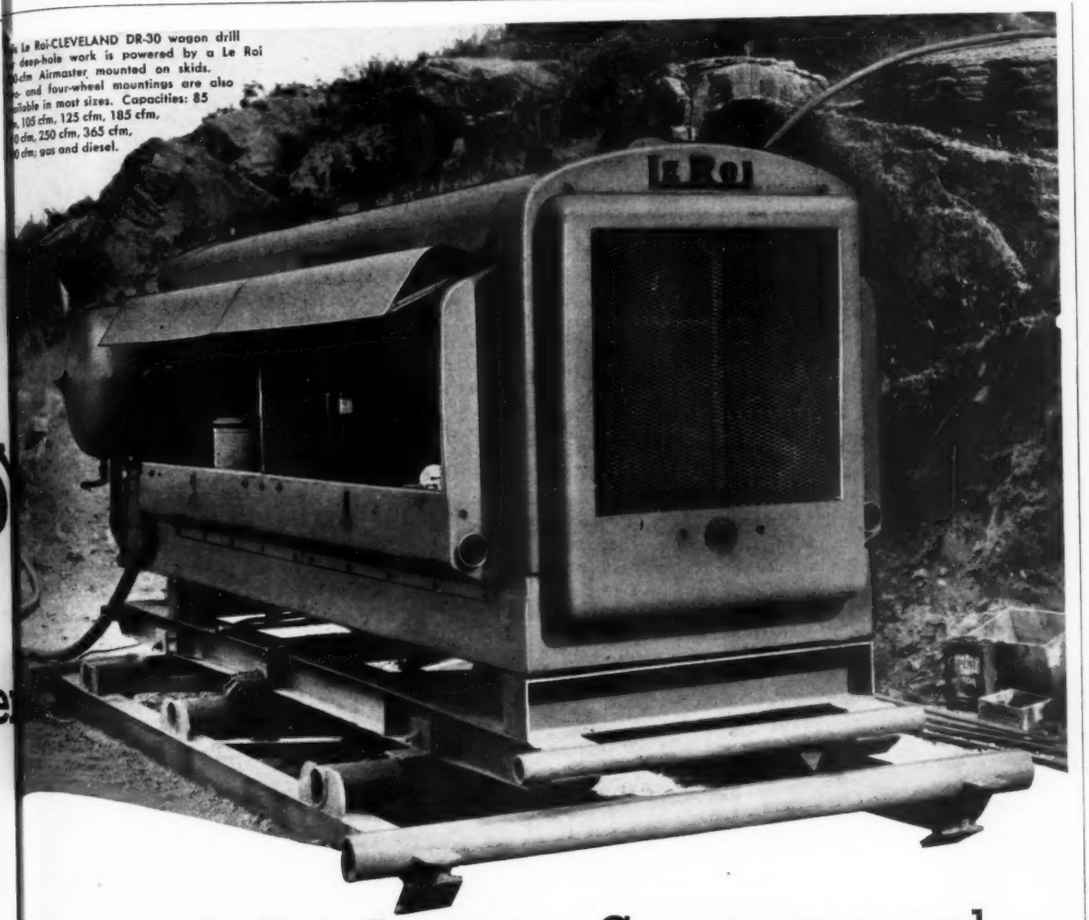
Officers for Power Equipment

Burton G. Davidson has been appointed president of Power Equipment, Inc., Beltsville, Md. Other new officers are Daniel J. Gettings, vice president; Robert A. McDonald, treasurer; and Stuart Godwin, Jr., secretary of the organization.

Dealer for Automatic Devices

The new east Texas distributor for Adjustomatic scaffolding, manufactured by Automatic Devices, Inc., is A. Bundy Jones Co., 2309 Mobberly, Longview.

The Le Roi-CLEVELAND DR-30 wagon drill for deep-hole work is powered by a Le Roi 600-cfm Airmaster, mounted on skids. Two- and four-wheel mountings are also available in most sizes. Capacities: 85 cfm, 105 cfm, 125 cfm, 185 cfm, 210 cfm, 250 cfm, 365 cfm, 600 cfm; gas and diesel.



...with Le Roi Airmaster Compressors and Le Roi-CLEVELAND Air Tools on the job

AIR POWER is so widely used, because it does so many things — because it saves money.

And money-saving air power costs less, when you use Le Roi Airmaster Compressors. Here's why:

- Le Roi, with 8 sizes and 14 models, offers the widest range of portable-compressor sizes available. Now you can match your job requirements exactly, with an Airmaster Compressor that lets you do the most work for the least cost.
- Le Roi Airmasters are powered by a heavy-duty Le Roi engine designed especially for compressor service. Conservative engine ratings give you ample power reserve — for lower fuel consumption, less maintenance, lower operating costs. Magneto ignition gives you quick, easy starting — saves time, lets you get going faster.

For still better results, still lower costs, use Le Roi-CLEVELAND air tools with your Airmasters. They will drill more rock, dig more clay, break more pavement, tamp more fill for you.

Use this team and you will find, as so many have, that Le Roi gives you more for your money — more air power, more footage, more profits. See your Le Roi distributor or write us for further information.

Compressors
Rock Drills
Tractair
Engines

LE ROI COMPANY Milwaukee 14, Wisconsin

A Subsidiary of Westinghouse Air Brake Co.

Plants: Milwaukee • Cleveland—Greenwich—Dunkirk, Ohio • Coldwater, Mich.

C-188

Nation-Wide Sales-Service Network

ALABAMA: Birmingham, Mobile — ARIZONA: Phoenix — ARKANSAS: Little Rock — CALIFORNIA: Bakersfield, Long Beach, Los Angeles, San Francisco — COLORADO: Denver, Grand Junction — CONNECTICUT: Hartford — FLORIDA: Jacksonville, Miami, Tampa — GEORGIA: Augusta, Decatur — IDAHO: Boise, Idaho Falls, Twin Falls — ILLINOIS: Chicago — INDIANA: Indianapolis — IOWA: Cedar Rapids, Des Moines, Waterloo — KANSAS: Great Bend, Kansas City, Pratt, Wichita — KENTUCKY: Lexington, Louisville — LOUISIANA: New Orleans, Shreveport — MAINE: Augusta — MARYLAND: Baltimore, Hyattsville — MASSACHUSETTS: Hyde Park, Newton Highlands, Worcester — MICHIGAN: Detroit, Grand Rapids — MINNESOTA: Duluth, Minneapolis — MISSISSIPPI: Jackson — MISSOURI: Joplin, St. Louis — MONTANA: Billings, Great Falls, Kalispell, Missoula — NEBRASKA: Omaha — NEW HAMPSHIRE: Manchester — NEW JERSEY: Cranford, Kingston — NEW MEXICO: Albuquerque — NEW YORK: Albany, Binghamton, Buffalo, Long Island City, Newburgh, Rochester, Saugerties, Syracuse, Whitesboro, Woodside (L.I.) — NORTH CAROLINA: Charlotte — OHIO: Cincinnati, Cleveland, Columbus, Dayton, Toledo — OKLAHOMA: Oklahoma City, Tulsa — OREGON: Portland — PENNSYLVANIA: Bethlehem, Harrisburg, Philadelphia, Pittsburgh — RHODE ISLAND: Providence — SOUTH CAROLINA: Columbia — SOUTH DAKOTA: Rapid City, Sioux Falls — TENNESSEE: Chattanooga, Knoxville, Memphis, Nashville — TEXAS: Dallas, El Paso, Houston, Lubbock, San Antonio — UTAH: Salt Lake City — VIRGINIA: Richmond, Roanoke — WASHINGTON: Seattle, Spokane — WEST VIRGINIA: Clarksburg, South Charleston — WISCONSIN: Milwaukee — WYOMING: Casper.

CONVENTION CALENDAR

May 3-8 Concrete Reinforcing Steel Institute

Meeting, Concrete Reinforcing Steel Institute, Boca Raton Hotel, Boca Raton, Fla. H. C. Delzell, managing director, 38 S. Dearborn St., Chicago 3, Ill.

May 3-8 Wire Reinforcement Institute

Annual Spring Meeting of the Board of Directors and Members of the Wire Reinforcement Institute, Boca Raton Hotel, Boca Raton, Fla. Frank B. Brown, managing director, WRI, 1049 National Press Bldg., Washington 4, D. C.

May 4-6 Highway Transportation Congress

Fifth Highway Transportation Congress, Mayflower Hotel, Washington, D. C. National Highway Users Conference, 952 National Press Bldg., Washington, D.C.

June 9-12 National Assn. of County Officials

Eighteenth Annual Conference and Highway Exposition, National Association of County Officials, Ak-Sar-Ben Coliseum, Omaha, Nebr. Keith L. Seegmiller, secretary treasurer, 1616 Eye St., Washington, D.C.

June 9-12 National Society of Professional Engineers

Twentieth Annual Meeting, National Society of Professional Engineers, Schroeder Hotel, Milwaukee, Wis. Kenneth E. Trombley, NSPE, 1121 15th St. N.W., Washington 5, D.C.

June 13-18 American Society for Testing Materials

Annual Meeting and Exhibit, American Society for Testing Materials, Sherman and Morrison Hotels, Chicago, Ill. A. G. Wilson, senior assistant editor, ASTM, 1916 Race St., Philadelphia, Pa.

June 15-18 American Society of Civil Engineers

Meeting, American Society of Civil Engineers, Hotel Chalfonte-Haddon Hall, Atlantic City, N. J. Don P. Reynolds, assistant to the secretary, ASCE, 33 W. 39th St., New York 18, N.Y.

June 21-23 Conference on Thin Concrete Shells

Conference on Thin Concrete Shells, Massachusetts Institute of Technology, Cambridge, Mass. Summer Session Office, Room 7-103, MIT, Cambridge, Mass.

June 28-30 American Society of Landscape Architects

Meeting, American Society of Landscape Architects, Hotel Somerset, Boston, Mass. Bradford Williams, corresponding secretary, ASLA, 9 Park St., Boston 8, Mass.

Diesel Fundamentals Are Treated in New Book

A basic book covering the mechanics of the diesel and the high-compression gas engine has been issued by the American Technical Society. Called "Diesel and High Compression Gas Engines—Fundamentals", the book is designed to give the reader an understanding of the principles, construction, and operation of diesel engines.

All diesels are basically the same, the author points out, citing the fact that the fuel-injection system of every diesel does the same job—that is, putting fuel into the cylinder in a measured amount, at the right time, and broken up into fine particles. In addition to explaining engine principles, the book shows how they may be applied in different ways in the several engine designs.

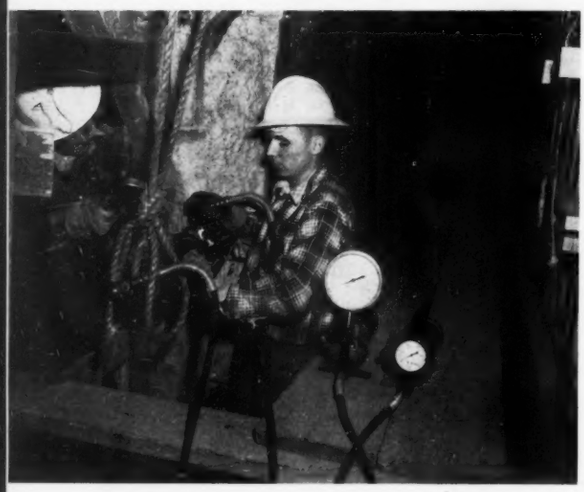
Written by Edgar J. Kates, consulting engineer, the book discusses such subjects as a diesel's construction, fuels, engine rating and performance, stationary and moving parts, lubrication, and operation and maintenance. The book sells for $5.50 and can be ordered from the American Technical Society, 848 E. 58th St., Chicago 37, Ill.

Prestressed Concrete Used in Brewery Job

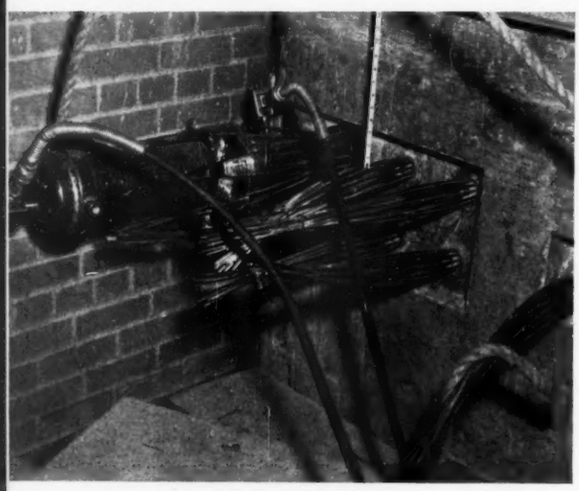
Construction of fermenting-cellar building continues through winter with structure enclosed and heated

By RALPH MONSON, Field Editor

Sonovoid tubes of 9-inch diameter are laid 13 inches apart, with prestressing cables in between, before pouring of the 16-inch concrete roof slab for the Hamm brewery building, St. Paul, Minn.



A workman tightens wedges which hold the cables in the prestressing jack. The pressure gages indicate the load applied to the cables. Elongation is also measured.



A closeup of the Freyssinet prestressing unit being used in the brewery roof slab construction. Each of the 12 strands of wire in the cables has a diameter of 0.192 inches and a tensile strength of 250,000 psi.

Workmen on Waco scaffolding bring up the brick curtain-wall to form the exterior of the building. The outside wall is independent of the tank structure.

A PRESTRESSED ROOF and partial prestressing in the longitudinal direction of walls and slabs of a multistory tank structure are features of a six-story fermenting-cellar building being completed this spring for the Theo. Hamm Brewing Co., St. Paul, Minn. Despite below-freezing temperatures, comfortable working conditions were maintained throughout the winter by enclosing the entire structure with plywood and canvas and heating the interior with steam units.

The fermenting building represents part of an $8,000,000 construction program for 1953 and 1954, which in turn is only a portion of a $20,000,000 expansion program begun by the Hamm company in 1946. Completion of the fermentation building will increase the capacity of the brewery to 2,000,000 barrels annually.

General contractor for the project is Foley Bros., Inc., St. Paul. Borsari Tank Corp. of America, New York, N. Y., designed and is supervising construction of the structure.

Consisting essentially of multistory concrete tank blocks, the building measures 61 x 92.5 feet on the outside walls. Most floors are subdivided into six tanks, three on either side of a center corridor. The vertical dimension is 9 feet from floor to floor. A basement contains pumps and air-conditioning equipment for the building. The roof is supported on the tank structure, but outside walls of brick lined with 4 inches of cork insulation are entirely separate from the tank structure.

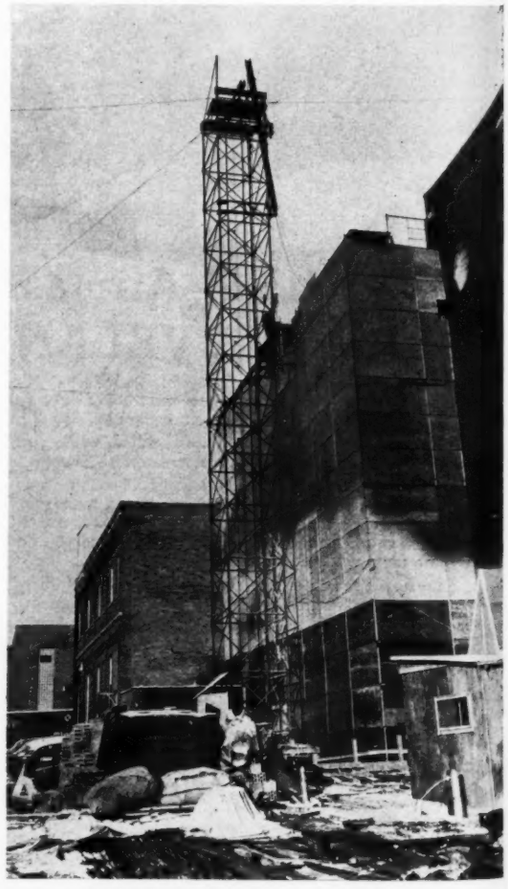
The roof is a concrete slab 16 inches deep, with clear spans of 37 feet 2 inches. Sonovoid tubes, 9 inches in diameter, are spaced at approximately 13-inch intervals to reduce dead load and concrete volume. Floors of the tanks are 13-inch uniform concrete slabs, and walls are 8 and 9 inches thick. A normal amount of conventional reinforcing is included.

Interior of the finished tanks is lined with jointless Borsari Ebon lining, ⅜ inch thick. Corridors are finished with ceramic tile. Exposed concrete surfaces are given a rubbed finish. Each tank has one opening in addition to the several pipes which enter it. This opening is a manhole about 26 inches in diameter entering from the corridor and fitted with a tight-fitting bronze door. Fermentation begins in the top tanks which are open and continues as the liquid is drawn by gravity to the closed tanks at the lower levels.

Footings on Rock

Excavations for footings were carried down to solid rock, although this meant underpinning an adjacent building whose spread footings were at a higher elevation. Steel needle-beams were placed to support the old footings, while excavations were carried as far as 18 feet below them. Approximately one-third of the area was excavated at a time, and the concrete was poured in this area before the next section was excavated. Concrete for footings and substructures was placed by a Northwest 80-D crane using a Gar-Bro 1-yard bottom-dump bucket.

Concrete for the first two stories



A temporary plywood and canvas structure completely encloses the job, permitting workmen to continue construction during the winter months. Only the Lakewood hoisting tower is exposed to the weather.

was hoisted by crane and bucket to a hopper on the floor and transported from there to the forms in buggies. Above the second floor, materials were hoisted in two Lakewood steel towers, one at each end of the building. The skip in the east tower was operated by a Clyde hoist powered by a Le Roi engine. The west tower contained an American hoist driven by a Minneapolis-Moline engine. Both towers had Chicago booms for handling bulky materials.

A concrete bucket in the west tower carried concrete from the truck mixers to a Gar-Bro twin hopper located on the floor where the pour was being made. This hopper, with a capacity of 2 cubic yards, had two hand-operated gates from which concrete flowed into buggies. Workmen wheeled the Jackson buggies from the hopper to the forms.

Ready-mix concrete was delivered to the job by Guaranteed Concrete Co., St. Paul. The mix was designed for a strength of 3,500 psi and contained aggregates graded from ¾ inch down. Plastiment admixture was added to Lone Star high-early-strength cement at a rate of ½ to ¾ pound per sack. An air-entraining agent was also added to the concrete for external foundation walls.

Because of the relatively thin sections and large amount of reinforcing, slump of the concrete was maintained at 4 to 5 inches. External vibration of the forms by Syntron electric vibrators was augmented by internal vibration with electric vibrators.

Floors and the lower 18 inches of the walls were formed and poured together. This brought the construction joint up above the large fillets at the bottom of the tank. Canvas hoses were used to keep the concrete moist for curing. Where this was not convenient, the surfaces were sprayed by hand or were covered with Sisalkraft paper. Regardless of outside temperature, concrete was delivered at a temperature of about 65 degrees. Temperatures inside the housing were maintained well above freezing to provide favorable conditions for curing the concrete.

Forms Prefabricated

All forms were prefabricated in a shop set up in an adjacent building. Wall and ceiling panels were of plywood with conventional studs and wales. Curved metal forms in all corners produced large-radius fillets on all inside corners of the tanks. Both metal and plywood forms were designed for ease of handling and for re-use. They were moved from tank to tank as construction progressed and were used eight or more times.

Positioning the curved metal forms and holding them securely in place involved the use of a large number of special chairs and form ties in addition to the standard ties used on the plywood panels. Superior metal ties and chairs were used exclusively.

Sika retarder was painted on the inside forms to slow the setting of the cement on the interior surfaces of the tanks. As soon as possible after the forms were removed, these interior surfaces were sandblasted by a Vacu-Blaster. Using steel grit, this machine removed enough of the retarded mortar to leave a roughened surface consisting primarily of aggregate faces. This surface assured a good bond for the Ebon lining which was then applied. A suction device on the Vacu-Blaster removed the dust as the blasting was being done, much in the manner of a vacuum cleaner.

Prestressing

Prestressing cables were Freyssinet prestressing units consisting of 12 strands of wire with a diameter of 0.192 inches and a tensile strength of 250,000 psi, and enclosed in a flexible metal sheath. Cables were care-

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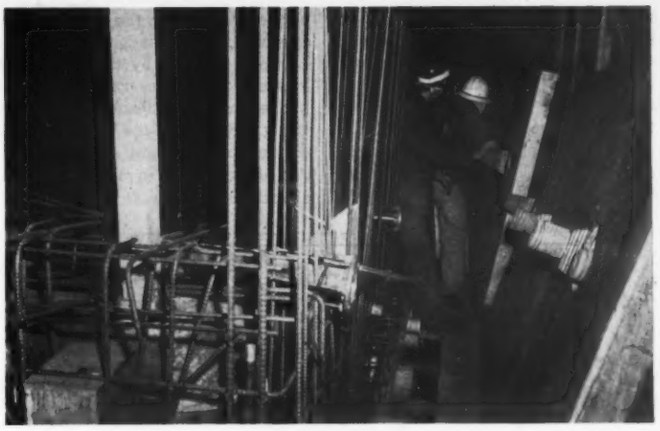
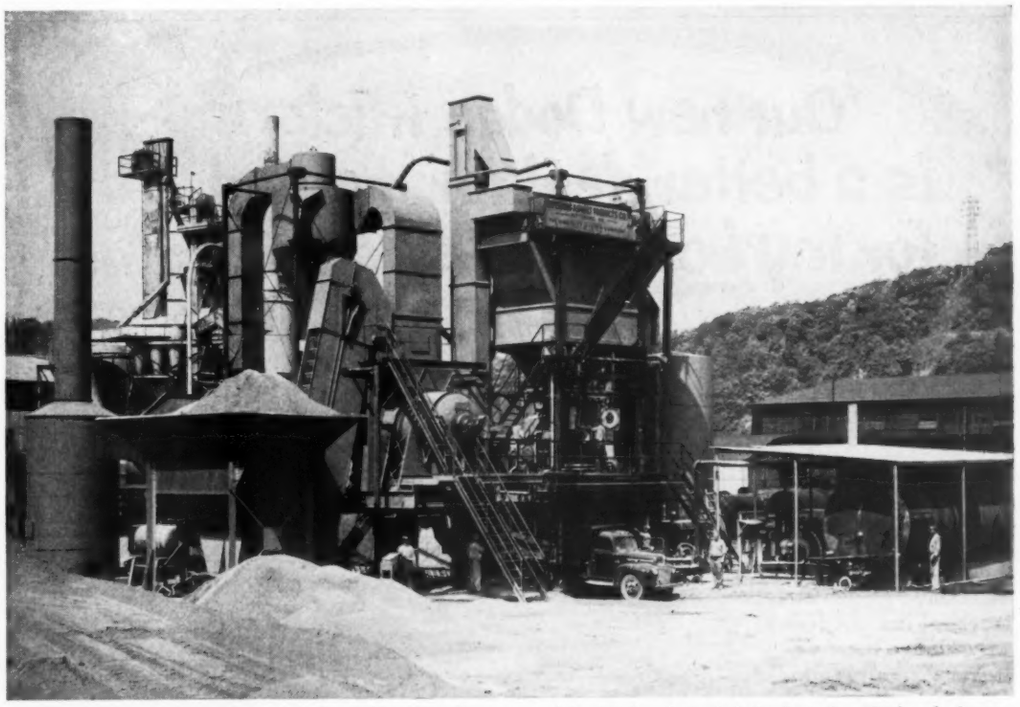


Plywood form panels are moved from tank to tank as pouring progresses on the Theo. Hamm brewery project. The forms are re-used an average of eight times.



The Model S-100 Asphalt Plant, one of two Simplicity Plants owned by Pittsburgh Asphalt Products Co., Pittsburgh, Penna.

Buying an ASPHALT PLANT
is a big investment. To really get the facts, go see the plants in operation.
Talk to the men who are running them!

THE SIMPLICITY SYSTEM
FROM BUILDER TO BUYER
BETWEEN MEN WHO KNOW

There's a
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On request, we'll be glad to send you the name and location of a nearby installation.

DEPENDABLE
THE SIMPLICITY SYSTEM COMPANY
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(*Continued from preceding page*)

fully tied in place along with the conventional reinforcing steel. Precast-concrete cones for anchoring the wires were attached to the inside of the form panels prior to erection of the forms.

A hand-operated hydraulic jack applied tension to the stress wires, after which the strands were securely clamped in place by the Freyssinet locking cone. Pressure gages on the hydraulic jacks indicated the tension being applied to the wires, but a careful measurement of the elongation of the wires was made to double-check the final stress.

Concrete - pouring operations started about September 1, 1953, and continued into January of this year. In the St. Paul area this meant protecting the work and the workmen against subzero temperatures and winter storms. In this case the contractor built a framework around the entire building, enclosing the sides with plywood and the roof with canvas. Inside this protective cover heat was furnished by steam unit heaters supplied from the plant heating system. Artificial light was also needed.

The enclosure was made large enough so that Waco scaffolding could be set up outside the building and within the enclosure. From this scaffold the bricklaying crews laid the outside walls, following closely behind the tank construction inside. When the enclosure was removed, the exterior of the building was complete.

Personnel

During most of the construction period two 8-hour shifts were employed. At the peak of employment 200 men were working on the project. Al Strand was general superintendent of the entire project for Foley Bros., Inc. Richard Skoglund supervised work on this particular structure. E. J. Critzas represented Borsari Tank Corp. of America on the tank-construction operations. Craig Woolley, assistant plant engineer, represented the Theo. Hamm Brewing Co. THE END

Traffic Keeps Moving As Tunnels Are Cleaned

Even while the Squirrel Hill Tunnels on Pennsylvania's Penn-Lincoln Parkway were being built, it was apparent that cleaning crews operating through the passageway would delay traffic. And so, before the tunnels were finished, the highway department was already planning a 1,500-gallon detergent truck and a 2,000-gallon flushing truck to do the cleaning job.

These vehicles, using a wash crew of three men, now handle the 1½-mile job in two and a quarter hours.

The soap-solution truck moves up one side of the tunnels at a speed of 12 miles an hour to complete one pass in from 6 to 9 minutes. A sprayer on the truck washes both walls of the tubes without refilling. If the ceiling is washed at the same time, one tube can be finished before the tank needs to be refilled.

Four minutes after the walls are sprayed with soap and water, the rinse truck takes over, moving through the tunnels at the rate of 8 miles an hour to allow for a good spraying. The 2,000-gallon flushing truck rinses only one wall at a time and must be refilled between trips.

Since work is done only during hours when travel is light, traffic is delayed only slightly. While no vehicles are permitted to pass either the soap or flushing truck during the 9 minutes required for the trip through the tunnel, they can follow the trucks at a safe distance.

Two tunnel maintainers and an assistant, together with a plaza attendant, handle the complete job. Drivers operate the cleaning controls from the truck cab. The assistant tunnel maintainer, plaza attendant, and electrician place the sign and lane markers and operate the signals and stop lights which control traffic through the tubes.

Two Euclid Appointments

The new district representatives in the middle Atlantic states for Euclid Division, General Motors Corp., Cleveland, Ohio, are John A. Polhemus and Charles B. Pace. Both men will divide the territory formerly handled by William F. Myer, who remains with Euclid in a consulting capacity.

Mr. Polhemus will cover the northern part of the territory, including Connecticut, western Massachusetts, northern New Jersey, and the eastern section of New York. Mr. Pace's territory includes southern New Jersey, most of Maryland, eastern Pennsylvania, and all of Delaware.

"BERG" Concrete Surfacer

A light-weight, portable, electric motor-driven Concrete Surfacer consisting of the Model R2 Right Angle Head and Model AS Motor Unit.

Ideal for surfacing concrete buildings, bridges, dams, walls and many other applications.

Quickly converted into the Model V2-AS Concrete Vibrator for internal vibration by substituting the Model V2 Vibrator Unit for the above Head.

The Concrete Surfacing Machinery Co.
4665-4669 Spring Grove Avenue Cincinnati 32, Ohio

"Our new Dodge truck is a better deal for me and for my boss, too!"

Our new Dodge "*Job-Rated*" trucks have proved a better deal in handling ease, visibility, comfort and power. You, too, can save time and money, work and effort with these great new trucks. Find out today why Dodge means a better deal all around!

YOU GET—A Better Deal In Steering! Sharp 39° turning angle and short wheelbase design make Dodge the sharpest turning trucks on the road. That saves you *time!*

YOU GET—A Better Deal In Seeing! Big 951 sq. in. windshield of Dodge cab is largest of any popular truck. All-around visibility is tops, too, for safer driving.

YOU GET—A Better Deal In Sitting! The 16-inch-high Dodge seat is deep and comfortable enough to be in your living room! Plus easy-to-reach controls and dispatch box.

YOU GET—A Better Deal In Power! You save on maintenance because every Dodge engine . . . V-8 or Six . . . has such long-life features as exhaust valve seat inserts, chrome-plated top piston rings and positive-pressure lubrication.

New Dodge trucks give A BETTER DEAL FOR THE MAN AT THE WHEEL—and a better deal for the man who pays the bills. Test-drive and learn how a Dodge makes driving easier and does more work in less time. Give your Dodge dealer a call. He'll be glad to show you.

DODGE "Job-Rated" TRUCKS

TUNE IN: "Break the Bank," Sunday TV—"The Roy Rogers Show," Thursday radio—"Make Room for Daddy," Tuesday TV.

Instruments Control Moisture in Concrete

■ A moisture-control system for concrete-producing plants measures and records the moisture in concrete aggregates for every batch of concrete. The equipment is offered by Instant Moisture Control Division of Colorado Pre-Mix Concrete Co., 1021 W. Mississippi Ave., Denver 19, Colo. The installation of an IMC system makes it possible for the operator to tell at a glance the moisture content of the aggregate and to adjust for it accurately as each batch is weighed. In doing this, the device takes only two to five seconds additional time to operate.

The manufacturer points out that the IMC equipment saves the cost of machinery, personnel, and time used in adding water to dry loads to provide proper consistency. It also eliminates overly wet loads that are subsequently rejected and re-routed to other jobs or returned to the plant.

For further information write to the company, or use the Request Card at page 18. Circle No. 444.

Attachments and Mixer For Oxyacetylene Torch

■ A new cutting attachment and a jet-type mixer are reported to extend the cutting, welding, and heating range of the Airco Style 800 general-purpose oxyacetylene torch. The new jet mixer handles all welding and heating-tip sizes without flame sputtering, popping, or flashback, according to the Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y. Rubber sealing rings provide a gas-tight seal with hand tightening.

The new cutting attachments, the Airco Styles 1800 and 2800 provide added versatility and cutting range to the Airco 800 torch. The Style 1800 cuts steel up to 6 inches thick, and the Style 2800 cuts steel up to 8 inches thick. Standard Airco cutting tips—any one of the tips designed for the Styles 3000 and 9000 hand torches—may be used with the attachments.

For further information write to the company and request a copy of ADC 837, or use the Request Card at page 18. Circle No. 453.

Bulletin on Chain Hoists

■ A complete bulletin covering recently announced P&H chain hoists is now available. Illustrating each type of hoist, the bulletin includes descriptions as well as condensed specifications. It covers all types of hoists with capacities from ¼ to 25 tons.

To obtain this literature write to the Harnischfeger Corp., Hoist Division, 4400 W. National Ave., Milwaukee 46, Wis., or use the Request Card that is bound in at page 18. Circle No. 467.

Concrete-Cutting Saws In Variety of Models

■ Four models of its line of concrete-cutting saws are illustrated in literature from the Cutcrete Corp., Pasadena 8, Calif. Models shown include the 2¼-hp Model J-T and a 14.6-hp single or tandem-blade unit, the Model S-T-T. The latter machine, used on longer cuts, has two blades in tandem. It can be changed to use one 20-inch blade for sawing to an 8-inch depth.

Also shown is the Model S-T-S, a single-blade 25-hp machine used for deep cutting. A dual-blade 30-hp version of the Model S-T-S is used for sawing grooves for trenches up to 5 feet wide.

The literature discusses such Cutcrete features as the Trail Blade design, step-cutting in tandem-blade models, and a steering device that aligns the machine's wheels to offset drift due to a slope or crown in the pavement. It also describes two types of blades available for the concrete-cutting machines.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 428.

Dart Regional Managers

Walter C. Clayton, formerly western sales manager, has been appointed southern sales manager of the Dart Truck Co., Kansas City, Mo., maker of trucks and trailers.

Replacing Mr. Clayton as western sales manager is Mark Kasper.

WALTON'S FAMOUS *EverForm* PLASTIC SURFACED CONCRETE FORM PANELS provide maximum re-use value in all types of concrete form work. The sleek, durable, diamond-hard surfaces assure super-smooth concrete, longer "on the job" service and the ultimate in re-uses. The inner core of ***EverForm*** panels is waterproof (EXT-DFPA) Douglas Fir Plywood. Produced by one of the nation's pioneer Fir Plywood Manufacturers.

Samples on request

WALTON PLYWOOD COMPANY, INC.

General Sales Office
644 East 38th Street—Suite #205
Indianapolis 5, Indiana

Mill and General Offices
Everett, Washington

Pouring concrete—Pierce & Phelps Co. bldg., Phila., Pa. Robert E. Lamb Co., contractors. Photo by E. Troiani.

Speed UP construction... Slow DOWN cost!

Sonotube®

FIBRE FORMS

for round columns of concrete

Low cost SONOTUBE Fibre Forms save man-hours on the job because they are lightweight and easier to handle . . . take less time to erect because they require minimum bracing.

For a fast, economical method of forming round columns of concrete, use SONOTUBE Fibre Forms . . . job-proven by contractors, engineers, and architects everywhere to save time, labor and money!

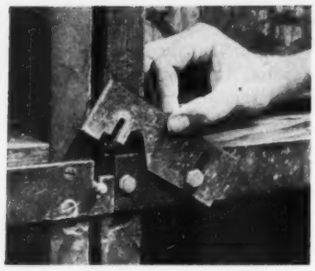
SONOTUBE Forms can be sawed to your requirements on the job or supplied in specified lengths. In 31 sizes, from 1" to 36" I.D. up to 50' long.

DENFORM, reusable capital form, designed for use with SONOTUBES. Write for details.

sonoco "ROUND THE WORLD" PAPER CARRIERS REG. U.S. PAT. OFF.

For complete technical data and prices—write

SONOCO PRODUCTS COMPANY
Construction Products Division
LOS ANGELES, CAL. — HARTSVILLE, S. C. — MAIN PLANT — MONTCLAIR, N. J.
GARWOOD, N. J. — BRANTFORD, ONT. — AKRON, IND.



In this piece of Simplex hardware the lever drops over the extended head of the tie to draw the adjoining forms together.

Hardware Simplifies Concrete Forming

■ New simplified interlocking hardware, reported to save a substantial amount of time in erecting forms in light building construction, is offered by the Simplex Forms System, Inc., 5514 N. 2nd St., Loves Park, Ill. The hardware is mounted directly to 2 x 8-foot or 4 x 8-foot forms. In erection, forms are placed in the approximate positions they will occupy, thus saving handling time. There is no loose hardware to worry about, since everything is mounted to the forms except the line-up brackets. Steel bands mounted to the forms serve as walers.

Both inner and outer forms are set up simultaneously and lined up accurately as each form section is locked into place. Locks draw the forms close together, minimizing ridges on the finished wall. Stripping time is decreased as forms are quickly unlocked. Made of case-hardened steel, the bars, levers, and screws are said to withstand high-pressure concrete.

For further information write to the company, or use the Request Card at page 18. Circle No. 364.

Additive Compensates For Concrete Shrinkage

■ A concrete additive that compensates for shrinking is offered by the A. C. Horn Co., Inc., 10th St. and 44th Ave., Long Island City 1, N. Y. Vibro-Foil is a metallic aggregate combined with a plasterizing material, a cement-dispersing agent, and a catalyst. It is used to resurface and patch concrete floors and to bond concrete surfaces. Further uses are found in grouting under machinery and in tile-grouting. In all these applications, the additive expands at a controlled rate to counteract initial shrinkage, then becomes neutralized.

A booklet just prepared by the manufacturer's research laboratories covers the properties of Vibro-Foil and gives some suggestions on the preparation of foundations for heavy equipment.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 375.

Sales Changes at Cleco

Eugene J. LaPorte, north central states salesman for the Cleco Division of Reed Roller Bit Co., Houston, Texas, has been appointed assistant to the sales division manager in Cleco's Chicago office. J. T. Roberts, senior salesman for the company in the Kansas City area, will be transferred to Chicago to replace Mr. LaPorte as salesman.

Hard-Facing Electrodes

■ New hard-facing electrodes for manganese steel are announced by Alloy Rods Co., 5129 W. Market St., York, Pa. Wear-Arc Super WH electrodes are said to provide superior strength and wear properties. The core wire used contains approximately 33 per cent alloy, balanced in proportions that are new in a hard-facing electrode.

Having a carbon content of only 0.35 per cent, the electrodes are said to produce the equivalent hardness of alloy steel containing three times this carbon content. This low carbon content, according to the manufacturer, prevents spalling and flaking of the weld deposit under operating conditions requiring severe impact.

The electrodes operate on either ac or dc current and are said to provide an abrasion resistance up to four times that of manganese steel. According to the company, tests indicate that this new electrode eliminates the necessity of using stainless steel or other types of electrodes for strength welds and manganese steel rods for wear resistance. It is stated that Super WH electrodes will join manganese steel to itself or to any other type of steel with greater strength and rigidity than stainless steel. It is also claimed that this new electrode will outwear, by a ratio of 4 to 1, the weld deposit of other manganese steel electrodes.

For further information write to the company, or use the Request Card at page 18. Circle No. 350.

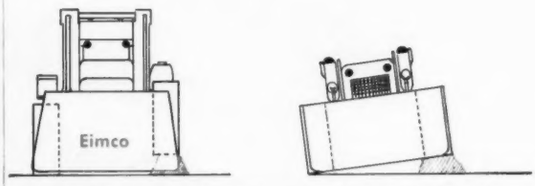
Fairfield Appointment

William H. McEnally is the new sales manager of the Standard Products Division of the Fairfield Engineering Co., Marion, Ohio.

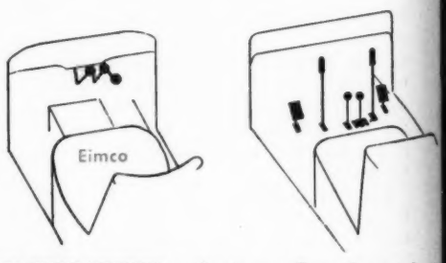
The Standard Products Division designs, manufactures, and markets a complete line of construction conveyors, hammermills, and bulk bins.

EIMCO

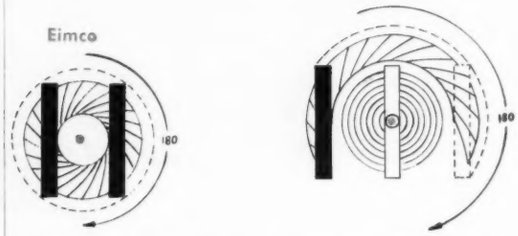
WORLD'S FINEST TRACTOR EXCAVA



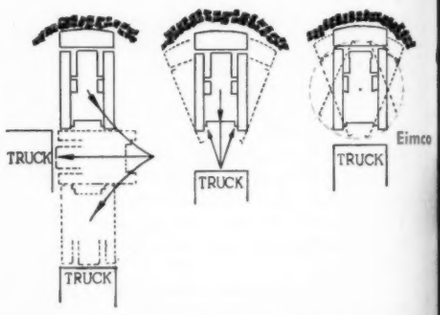
OSCILLATION — with loader attachment — exclusive on Eimco 105, this feature permits better loading on uneven floors in pits or stripping operations.



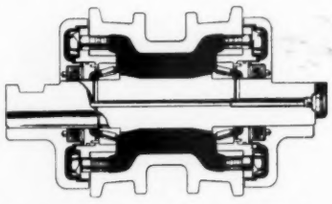
EASY SIMPLE CONTROLS — Eimco's easy finger tip controls gi... better maneuverability with less effort. Change speeds witho... stopping — instant reverse.



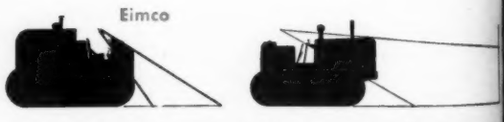
INDEPENDENT TRACK OPERATION — In a turn one track runs forward, the other reverse, cutting turning radius to a minimum. Eliminates excessive wear on track, rollers, idlers and track frame. On most machines one side is locked and skidded for a sharp turn.



MANEUVERABILITY — Faster loading into haulage units because ... Eimco's overhead loading action and independently controlled tracks. Note trucks can be kept closer, cutting haulage time.



THE EIMCO 105 TRACK ROLLER — A one piece cast alloy steel roller with bearing cages and husky shaft on Timken roller bearings completely sealed against dirt and moisture. Careful heat treatment prolongs life and maximum grease capacity assures lubrication.



BETTER VISIBILITY — The operator sits up front where he can s... Loading, bulldozing or pushing are more efficient, eliminate guesswo...

Every feature of the Eimco 105 is designed for maximum customer service with minimum maintenance. One of these features is the full oscillating track EVEN WITH THE LOADER ATTACHMENT. This is an exclusive feature on the Eimco 105 since standard practice in the construction field is to tie the tracks rigidly when a loader is mounted on any tractor unit.

The full oscillating feature prevents excessive frame twist, wear on tracks, rollers, and idlers. Traveling on uneven ground the heavy equalizer bar supports the front end of the tractor and rides freely in its universal type socket in each track roller frame so that either track is free to move up or down without tilting the engine or frame.

This feature provides maximum ground contact under all conditions and maximum drive which is essential in good digging and loading.

Write for information to The Eimco Corporation, P. O. Box 300, Salt Lake City, Utah.

Land-Clearing Unit Features Improvements

■ Design improvements have been announced for the Bushwacker, a heavy-duty land-clearing machine made by the American Steel Dredge Co., Inc., P. O. Box 570, Fort Wayne 1, Ind. This machine offers a mechanical means of clearing land without disturbing the topsoil. It does this with 20 flails made of heat-treated manganese alloy steel castings attached to a revolving drum. The flails are staggered to present a continuous cutting edge 72 inches wide.

As the machine moves into growth, a contact bar engages the brush or trees and bends them forward so that the flail heads strike as the tree fibers are under tension. Under the impact of the rapidly moving flails, the woody fibers and stalk trunks are reduced to mulch material which is deposited upon the clear ground. The limiting factor in performance is the diameter of trees in the area to be cleared. Practical ranges are from 5 to 6 inches for hard woods and 8 inches for softer woods, according to the manufacturer.

This improved version of the Bushwacker land-clearing machine has been modified for better balance. The unit flails a swath 6 feet wide.

A major improvement in the machine has been the introduction of a pressurizer cab as optional equipment. This cab gives the operator more comfort under severe, dry, dusty conditions.

The Bushwacker is mounted on a specially modified International TD-9 crawler tractor, onto which is built a tilting frame which supports the disintegrator in front of the tractor and a counterbalancing engine behind the tractor. A second change has been in the modification of this frame to better counterbalance the GM engine. In order to accomplish this, the position of the tilt cylinders has been moved farther towards the rear of the machine. This change has also eliminated the framework over the cab.

For further information write to the company, or use the Request Card at page 18. Circle No. 432.

Above left: Eimco 105 digs in stock pile of chunky limestone. Above right: Two speed bucket mechanism loads light trucks easily and fills big trucks full. Below left: Loading rock from pit. Bottom: Clearing slide area after heavy rain. Below right: High discharge loads into high railroad cars.

Earth Auger Pilot Bits

■ New earth auger pilot bits offered by the Petersen Engineering Co. include the Pengo combination fishtail-hardpan pilot and the Pengo cone pilot, which is specially designed for use in frozen ground. These pilot bits supersede both the former fishtail and hardpan pilot bits, and both are interchangeable with all types and sizes of augers and boring heads made by this company.

Both pilot bits have narrow fishtails that serve to open a small hole in hard surfaces. The forward curve moldboards of wedge-shaped design spiral their way into this hole to break out the hardpan or frozen ground through which the center shaft of the auger may pass.

To obtain further information write to the Petersen Engineering Co., 460 Kifer Road, Santa Clara, Calif., or use the Request Card at page 18. Circle No. 385.

I-H Appointments

Supervising motor truck fleet sales for International Harvester Co., Chicago, Ill., is Russel C. Burns, who has been with the company as general supervisor of used-truck merchandising since 1952. With I-H for 20 years, he has served in managerial capacities in several of the company's eastern sales offices.

R. H. White, formerly manager of the Tulsa district, has been appointed manager of the company's motor-truck district in Lubbock, Texas. Other sales personnel changes include the transfer of M. S. Howard, formerly assistant manager at Sweetwater, Texas, to the Lubbock office, and the promotion of R. L. Tracy, branch manager, Los Angeles district, to assistant manager of the Oakland, Calif., district.

A Tournapull climbs a 30 per cent grade back to the cut. Averaging ten loads per hour, the equipment ran up a production figure of 1,040 pay yards hourly. Tomei Construction Co., Van Nuys, Calif., holds the subcontract for grading work.

Equipment makes fast hauls over steep road to speed grading job in mountains and canyons

Grading Is Difficult for Freeway Rel

RELOCATING and rebuilding Highway 99 as a freeway in Weldon Canyon, Calif., is now three months ahead of contract schedule, despite some tough grading work required in this section of high mountains and deep canyons. When completed, the 2.97-mile project near San Fernando will provide a 4 to 6-lane divided freeway section.

Prime contractor on the $3,060,000 job is Griffith Co., Los Angeles and San Diego. The company started work last September 1, subcontracting the grading job to Tomei Construction Co., Van Nuys, Calif. This part of the project consisted of cutting to grade through mountains as well as providing fills in deep canyons, and materials involved included sand, sandstone, clay, and shale.

Dirt-Moving

The maximum cut on the job, measuring 250 feet, runs about 75,000 cubic yards per 100-foot station. The maximum depth of fill is 80 feet. For this grading job, yardage totaled 1,750,000 cubic yards, with 29,000,000 station yards overhaul. Weldon Canyon, a ¼-mile fill, accounts for 500,000 yards of this total. Embankments take 90 per cent compaction.

Grades in this mountainous area, ranging up to 35 per cent on the downhill trip, are 30 per cent for earth-moving units making the return run. To handle all the dirt, Tomei brought in eight Model C Tournapulls. Pushloaded with 13 pay yards, each machine hauled 1,500 feet down the 35 per cent grade

a full bucket every bite

You can't make money with an empty bucket! SHOVELOADER fills the bucket every time.

First—it gives you power downcrowd to the amazing depth of 25 inches. Second, you can tilt the bucket back as much as 30 degrees at ground level. This combination means natural "ground-breaking" digging action—faster excavating or stripping—and, profitable *full* bucket operation.

SHOVELOADER bucket is *wide*, wider than wheel treads. You can dig right up to the curbs or walls, making clean-up jobs easy. The tractor follows, without climbing, wherever the bucket can dig.

With lifting height of 10′ 10″ SHOVELOADER easily loads the highest truck. Long forward reach permits spotting loads in center of truck body. Long 100-inch wheelbase assures stability when digging, lifting or carrying loads.

Other exclusive built-in features increase utility by improved rough-terrain operation, greater operator safety, mobility, and longer life.

Standard 1½ yard bucket is interchangeable with 1¼ yard or 2½ yard sizes, also forks, lifting crane, backfill blade, bulldozer or snow plow. Write for 8-page descriptive bulletin. The BAKER-LULL Corporation, 370 West 90th Street, Minneapolis 20, Minn.

THE BAKER-LULL CORPORATION,
370 West 90th Street • Minneapolis 20, Minn.

Please send 8-page illustrated specification bulletin AD-55 on your 4-Wheel Drive SHOVELOADER

NAME.....

COMPANY.....

ADDRESS.....

CITY.....STATE.....

Baker Lull handling equipment

SHOVELOADER

ROAD BUILDERS — IT'S SENSATIONAL!

DRAGS **PECKERWOOD** DRAGS

STEEL SPRING WIRE ROAD BROOMS
MADE IN ANY C-O-N-T-I-N-U-O-U-S LENGTH UP TO 12 FEET
WIDTH 6 INCHES—IT'S DIFFERENT
ASSEMBLE YOUR OWN—IN ANY SHAPE REQUIRED—IN MINUTES, NOT HOURS

NO FRAME REQUIRED

MADE WITH KILN DRIED 6" WIDE HARDWOOD AND HEAVY SPRING STEEL WIRES TRIPLE OUT EACH HOLE. NOT STAPLE SET.

THIS IS IT! ORDER NOW

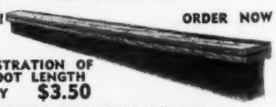


ILLUSTRATION OF 10-FOOT LENGTH
ONLY $3.50

RUNNING FOOT F.O.B. KC., MO.
NOTICE! Our 15" length Unit Drag 2" wide with the two bolts that fits your frame, still $2.50 ea.

SINCE 1928 **VAN BRUSH MFG. CO.**
327 S. WEST BLVD., KANSAS CITY 8, MO.

Heading for the fill area, loaded Tournapulls move down a 1,500-foot 35 per cent grade on the Weldon County freeway job near San Fernando, Calif. The 3,000-foot round trip is made by the machine in 5½ minutes.

Brush Cutter and Saw Fit Versatile Power Unit

■ A 2-hp power unit that mounts three brush-cutting attachments and a chain saw is illustrated in literature from Hoffco, Inc., 411 N. 8th St., Richmond, Ind. This hand-held power unit mounts a chain saw that cuts trees up to 8 inches.

The equipment is carried over the operator's shoulder and reaches down to ground level. The other attachments include the Scythette, a power scythe for cutting weeds, grass, and reads; and the Brushette, with a powered 10-inch-diameter blade that cuts brush. The Trimette, a unit with an 8-inch blade, is used for trimming.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 468.

wa Relocation

to the fill. And in spite of having to climb 30 per cent grades on the return trip, the Tournapulls completed the 3,000-foot round trip every 5½ minutes. With each machine moving 10 loads per 55-minute hour, combined hourly production ran to 1,040 pay yards.

Paving

When the project is completed, the freeway will have a paving of 4-inch select material with a 4-inch cement-treated base with 95 per cent compaction and an 8-inch portland-cement concrete pavement. Access lanes and decelerating lanes will consist of 6 inches of select material, with 6 inches of untreated rock base topped by a 4-inch asphalt concrete pavement. Including access roads, the project calls for paving of 6 miles of 4 and 6-lane road within the 3-mile contract.

Hal McGregor is job superintendent for Griffith Co., and Joe Porcher is general superintendent. For Tomei, Julio Tomei is general superintendent, and Perry Tomei, job superintendent. Robert H. Butler is resident engineer for the Division of Highways, and E. A. Parker is field supervisor. THE END

Ramset Names Manager

Ramset Fasteners Division of Olin Industries, Inc., Cleveland, Ohio, has named R. E. Mullis of Charlotte, N. C., as district sales manager. His territory covers the states of North and South Carolina and Tennessee.

Service lines go in fast with the new Ottawa backhoe on one end of the MM UTIL Wheeler and heavy-duty loader on the other. Unit trenches, loads, backfills and levels.

Speed service-line trenching with a cost-cutter on each end

Heavy-duty trenching for utility service lines becomes a faster, lower-cost job with this new Ottawa backhoe on one end of a Minneapolis-Moline Wheeler and loader on the other.

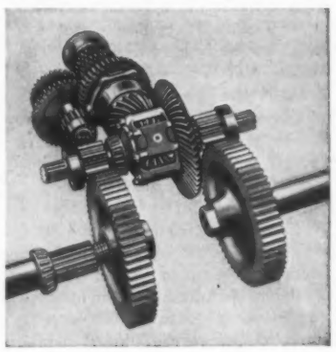
This Wheeler backhoe unit digs clean, square trenches, ditches and footings to a 9 ft. depth, offers bucket widths to 36". Backhoe reaches 15'4" for digging, 8'3" for dumping into highest trucks. Loader backfills and levels to complete the job with cost-cutting speed.

A complete line of unitized attachments makes full use of extra Wheeler power, greater Wheeler torque at moderate engine speed. Attachments include forks for loading and hauling, lifting cranes, excavating and loading buckets, dozer blades, scrapers, winches, snowplows, material handling and maintenance equipment for construction, mining, all industry.

With "high turbulence" gasoline or "turbo-cell" diesel engines, MM Wheelers deliver full-rated power, extra-heavy construction that pays off in longer unit life.

Before you buy any loader, see your Minneapolis-Moline dealer-distributor. Have him demonstrate to you that low-cost Wheelers will *return* your money *sooner*, *pay* you *longer*.

MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA



UTIL Wheelers pay you in longer tractor life with heavier construction, live rear axles 3 inches in diameter, bull gear final drive, greater bearing surfaces. Transmission and differential operate in a constant oil bath.

AIR GEOLOGICAL METHOD FINDS GRAVEL DEPOSITS

DESIRABLY SITUATED

Could you make money by locating the material deposit with the **lowest hauling costs** near some construction project now planned? Or near a highway job you have? Do you need additional **gravel, rock, sand,** or other **mineral** deposits for your operations?

Prospecting by our trained specialists using geological research coupled with air photo interpretation drastically reduces expensive field work. This low-cost prospecting often accomplishes confidentially in **weeks** what ground reconnaissance could not in **years** of costly groping and undesirable publicity inflating option prices. Uses methods of World War II invasion terrain studies.

An explanation of your needs written on your business letterhead and a marked map brings you a proposal on our work for you and complete information. No obligation. Dept. CE-1, Washington Commercial Co., 1200 Fifteenth St. N.W. Washington 5, D. C., ADams 4-8060

Mowing around job sites, along highways, in plant yards is a low-cost operation with this flexible hydraulic drive mower mounted on the 30 hp. RTI Wheeler.

This Wheeler and hydraulically-controlled scraper offer leveling accuracy in a low-cost package. Heavy-duty 3-point hitch controls scraping depth, provides rigid mounting.

The Pitman Model 80 truck crane, equipped with the new gooseneck boom, can load material on or off a trailer and then fold its boom to haul the trailer to its destination.

New Gooseneck Boom On Hauling Truck Crane Gives Travel Clearance

■ A hydraulically operated gooseneck-type boom is now available as an optional accessory on the Model 80 4-ton truck crane offered by the Pitman Mfg. Co., 300 W. 79th Terrace, Kansas City 14, Mo. This unique boom was developed as a solution to overhead travel clearance problems. The Pitman crane is designed so that a trailer can be pulled by the same truck on which the crane is mounted. The crane can be used to load directly onto and off this trailer.

With the new gooseneck-type boom, the operator can then fold the boom down over a loaded trailer simply by pushing a lever at his regular operating station. The vehicle becomes ready for road travel in a matter of seconds. The manufacturer anticipates that this gooseneck boom will enable contractors to reduce equipment and manpower costs of handling and hauling pipe, poles, steel, and other materials.

It is reported that when the new gooseneck boom is unfolded for work, it has the same strength and capacity as the standard boom. The folding operation is accomplished with a hydraulic cylinder installed in a V-shaped opening about 4½ feet from the base of the boom. The folding unit is so designed that the stress in the boom resulting from a load is not on the hydraulic cylinder. Rather, it is on the heavy steel bars and pin which form the basic structure of the folding mechanism.

The Pitman Crane has a capacity of 4 tons on a 25-foot boom, or 3 tons on a 37-foot boom. Additional boom lengths up to 59 feet also are available. In addition to the optional goosenecking feature, the crane's standard booms are hinged at the side and can be folded for travel in less than 5 minutes.

For further information write to the company, or use the Request Card at page 18. Circle No. 404.

Movable-Bridge Systems

Electrical systems for movable bridges are described in an illustrated booklet, GED-1982, available from General Electric Co., Schenectady 5, N. Y. Amplidyne-control, electrically operated center-span drives, and interlocked control systems are described in discussions of lift, swing, or bascule-type movable bridges.

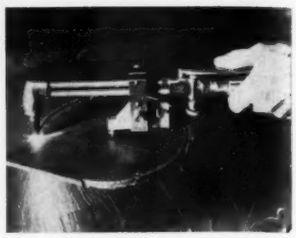
There are also case histories of various movable brides throughout the United States, together with illustrations of the structures. The booklet is available without charge.

Guides Are Developed For Metal-Cutting Torch

■ A line of precision-type cutting guides for individual gas flame metal-cutting torches is offered by the New Era Engineering Co., 458 W. 29th St., Chicago 16, Ill. The Neeco guides are used to cut circles, straight lines, bevels, and other shapes.

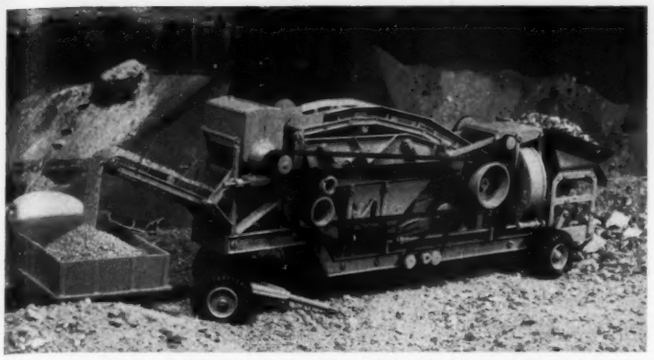
It is emphasized that with the guides, parts that would ordinarily take days to obtain from an outside source of supply can be produced quickly. The guides are said to permit marked economies when only one or a few parts is required.

Made in styles to fit all makes of torches (from 70 to 90-degree models), the guides are of three types. A small guide cuts circles from 1 to 15 inches in diameter, and another cuts circles 10 to 66 inches in diameter. A straight-line guide is also available which can be arranged for straight and 60 or 45-degree bevel cutting.

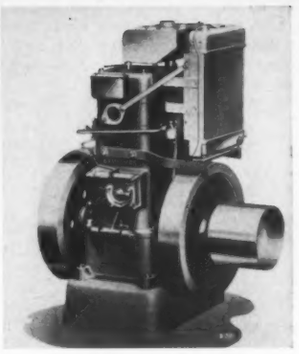


This Neeco guide is an aid for cutting circles in metal with a gas-flame cutting torch.

For further information write to the company, or use the Request Card at page 18. Circle No. 365.



START HIM YOUNG with this new toy, a scale model crushing and screening plant, which is an exact all-metal replica of a Cedarapids Pitmaster. The toy operates just like a real Cedarapids plant as the jaw and roll crushers move, the screen vibrates, and the conveyor belts run. It is made of heavy zinc die castings and is scaled ½ inch to the foot, making it 1/24 the size of the real plant. For further information write to Reuhl Products Inc., 4505 Belt Line Highway, Madison, Wis., or use the Request Card at page 18. Circle No. 390.



This Bamfords single-cylinder diesel engine is rated at 8 bhp at 700 rpm.

Diesel Engines Feature Easier Maintenance

■ Featuring a hinged crankcase and a detachable governor for easy adjustment, the Bamfords single and twin-cylinder slow-speed diesels rated at 3½ to 16 bhp at 600 to 700 rpm are now available in this country. The International Selling Corp., 122 E. 42nd St., New York 17, N. Y., has been appointed exclusive distributor for the line in the United States, Canada, and Mexico.

The seven models available are of the direct-injection type and are started by hand. They can also be equipped with auxiliary starting devices. The diesels are easily coupled and require no speed-reduction unit for most driven equipment. The hinged crankcase features easy access to working parts for inspection and maintenance so that injection lines and other vital connections are not disturbed. The governor is a detachable block unit.

The design and slow speeds of the Bamfords diesels are said to result in less wear on parts and lower fuel consumption per brake-horsepower hour. The overhead exhaust and screened inlet valves are operated by a single cam. The main bearing and rockers in the twin models have pressure lubrication. Replacement of the cylinder units is never necessary because the cylinder liner can be renewed.

For further information write to the company, or use the Request Card at page 18. Circle No. 469.

Mixers and Agitators For Truck Mounting

■ A line of transit-mixers and agitators is described in literature from the Transo Division, Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis. The Le Roi-Transo mixer is available in a wide choice of models ranging from 3 to 6½ yards.

Among features detailed is a direct drive that eliminates weight-consuming ring gears, and beveled gears and sprockets. The drum connects directly to the transmission through a large universal joint spider.

The mixers have a large industrial engine and a built-in centrifugal water pump of 50-gallon capacity. They feature a two-speed mixing and a two-speed discharge transmission. The planetary-type reversing transmission has spring-loaded clutches running in oil. Complete specifications include a drawing indicating component dimensions of components of the transit mixers.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 470.

B-E Offers Drill Tool Repairing at Englewood

A new churn-drill tool repair service is now available to users of blast hole drills in eastern states at the Bucyrus-Erie Co. sales and service station in Englewood, N. J., according to an announcement from the company's headquarters in South Milwaukee, Wis. New facilities, almost doubling the former area of the Englewood station, include a machine shop completely equipped to handle any type of drill tool repair or reconditioning.

E. S. Polyard, supervisor of drill parts, is in charge of the new facilities.

attachments

a big PAYLOADER® plus

"PAYLOADER" tractor-shovels equipped with standard buckets are extremely versatile. But the wide variety of available attachments greatly increases "PAYLOADER" usefulness and investment value — enables them to be profitably employed more days in the year.

So first choose the tractor-shovel that just *fits* your needs from the "PAYLOADER" line. It's the *one* complete line — seven *proven* models from 12 cu. ft. to 2 cu. yd. bucket capacity. Afterwards, you can acquire any of the special attachments, when and as you need them.

Your nearby "PAYLOADER" Distributor is ready to help you choose the model and attachments that best fit your needs. He also has the parts and service facilities to keep your "PAYLOADER" profitably productive. The Frank G. Hough Co., 762 Sunnyside Ave., Libertyville, Illinois.

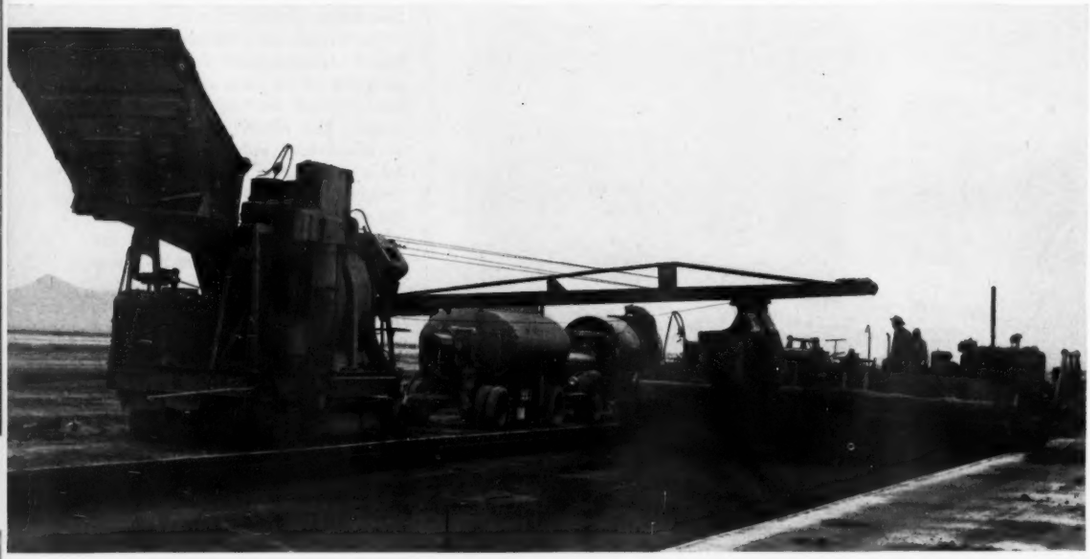
WRITE FOR FREE INFORMATION *on any "PAYLOADER" you are interested in: four-wheel-drive, rear-wheel-drive, front-wheel-drive — 12 cu. ft. to 2 cu. yd. bucket capacity.*

PAYLOADER®

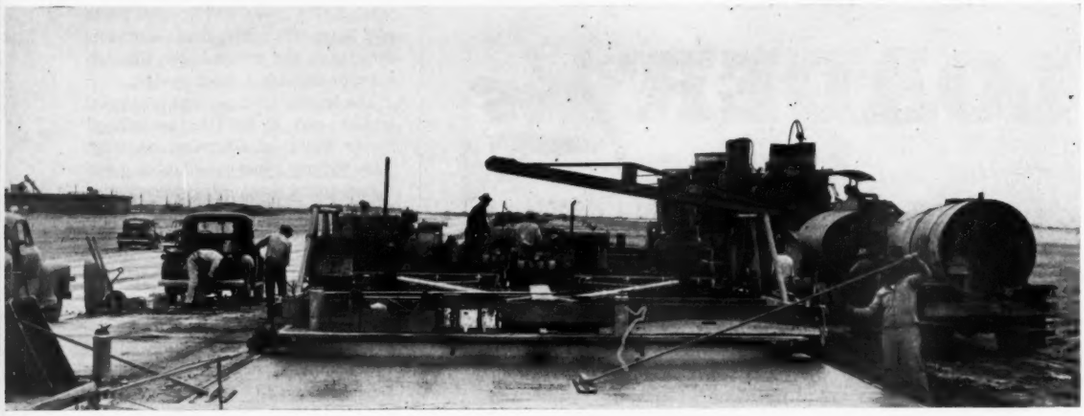
Towed by an International TD-24 tractor, this Lewis subgrader removes excess material between the forms. Disturbed earth was later rolled to insure full 90 per cent density in the subgrade.

New Equipment Is Used to Pave Parking Apron

By RAY DAY



Handling 37.4-cubic-foot batches of concrete, a Koehring 34-E Twinbatch paver dumps concrete into the center of the lane ahead of a Blaw-Knox spreader. A fleet of 5-batch trucks keeps the paver supplied with material.



A Lewis longitudinal float finisher is the last machine in the paving spread. Two cement finishers, working from each side, follow with long-handled floats to give final touches to the concrete.

Fresh concrete is dumped from a Koehring 34-E Twinbatch paver in front of a Blaw-Knox spreader. Ten Viber electric vibrators, suspended from a hydraulic Johnson bar on the spreader, consolidate the material.

USING ONLY a single paver and a conventional batch plant setup, joint venture contractors laid an average 1,200 cubic yards of portland-cement concrete daily for the parking apron at Davis-Monthan Air Force Base near Tucson, Ariz. On paving operations, two pieces of equipment were utilized to keep the work moving smoothly: one was a new finisher, the other, a single four-blade mechanical saw.

The apron itself is an odd-shaped slab—4,175 feet long, 1,175 feet wide at its broadest point, and 700 feet wide at its narrowest section. It is built on native subgrade in which Modified AASHO densities of 90 plus were developed. No flexible base was placed under the slab, which consists of 15 inches of concrete, thickening to 18 inches at the outer edges of the apron. Altogether, 154,000 cubic yards of portland-cement concrete went into the project.

Morrison-Knudsen Co., Inc., and R. A. Westbrook were the joint venture contractors on the job, which was engineered and supervised by the U. S. Army Corps of Engineers. The engineering design for the project was based on dual-wheel loads of 100,000 pounds. This takes care of all the heavy jet bombers now assigned to the base which, as headquarters of the 36th Air Division under command of Brig. Gen. Nils O. Ohman, is one of the major bases in the Air Force system.

Project Organization

To push the project to completion between July 27, 1953, and February 15, 1954, the job was organized for

Improved finisher gives smoother concrete surface; contraction joints are made with four-bladed saw

A workman uses a long-handled spray unit to reach halfway across the slab and spray Sealtex white pigmented curing compound onto the fresh concrete. The Techoke Co., Inglewood, Calif., handled the sealing job.

speed and efficiency. Project Manager Oliver Pope of the contractor's organization first made arrangements to locate the company administrative office in a building just outside the military reservation so that business could be conducted without visitors having to go through the red tape of securing a pass and submitting to a security check.

About 5 miles from the job site, and also off the military reservation, a rock plant for aggregate production was set up. The batch plant was located in an open area near the paving site. The sequence of paving operations had the paver place outer lanes first. Traveling the subgrade in a steadily decreasing area, the paver then placed succeeding lanes.

Easy Grading

The grading assignment, subcontracted to Marshall & Haas, involved about 150,000 cubic yards of unclassified excavation. Because of the sandy soil structure and the fact that Modified AASHO density requirements called for only 90 per cent plus compaction, this work was not too difficult. Marshall & Haas used a fleet of four Caterpillar DW21's, an International TD-24, and an Allis-Chalmers HD-20, along with a Caterpillar D8. One of the machines was used as a dozer, and the other two were used as pushers. Three 3,000-gallon water tank trucks placed the necessary moisture in the soil, and a pair of Southwest 50-ton pneumatic compactors easily tamped the fill. Caterpillar No. 12 motor graders bladed the finished subgrade. Drainage pipe was installed by Vinson Construction Co. on a schedule closely coordinated with grading.

Heavy Forms Necessary

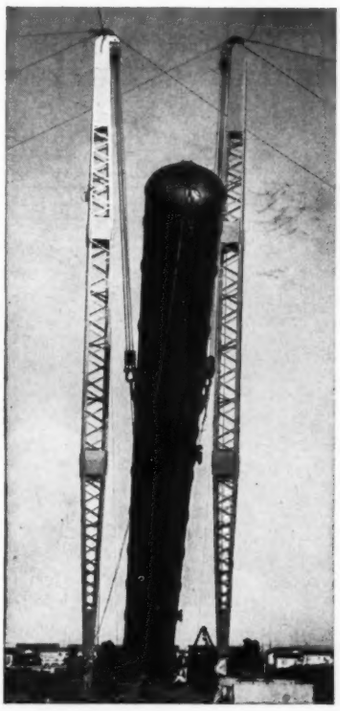
Since heavy-duty forms were needed to form the sides of the concrete slabs, an order was placed with Heltzel for 8,000 linear feet of reversible 15 x 20-inch steel form sections. The 20-inch dimension, placed in a shallow trench, was used to form the 18-inch thickened edge of the apron. Then the forms were turned and the 15-inch edge used for the balance of the job. These same forms were later used by Morrison-Knudsen and R. A. Westbrook on a large paving job at Edwards Air Force Base in California.

The apron consists simply of a series of 25-foot concrete lanes, joined together by a formed keyway. Dowel steel bars were placed only on the outside lanes and at construction joints. The Heltzel forms were set in lanes by an 11-man crew and a truck-mounted Hendy crane. Form pins were driven in the earth subgrade by a small 105-cfm Schramm air compressor and a pneumatic gun. Forms were lined up in the conventional manner: a tight string line was tied to survey stakes and the steel forms set to that line. The line of forms stayed about 1,500 feet ahead of the paver—more than an ordinary day's run.

A Lewis subgrader, towed by an International TD-24 tractor, did all the fine-grading. After about one inch of excess material had been scraped off the top surface, the dirt was moved ahead by a No. 12 motor grader or loaded out. A small Case-drawn Bros Wobble-Wheel pneumatic roller followed the subgrader to replace any disturbed earth to full 90 per cent density. Then the subgrade was rechecked and sprinkled, and the proper ground connections made so that the metal tie-down hairpins—which will be

Multiple-part Red-Strand Slings are always trusted to handle heavy loads. They are easy to apply to both the load and the crane hook. User tests in Detroit proved Red-Strand slings withstood unusual abuse, yet maintained higher-than-rated strength.

A Gary plant uses Red-Strand single-part slings for many lifting jobs like this. These slings are available with various combinations of end fittings for attaching the sling to rings or lugs. Single-part slings frequently are the most economical to use.



A heavy cylindrical load like this usually calls for the use of multiple-part Red-Strand Flat-Laced slings. They are strong, flexible and do not slip or abrade on smooth round surfaces.

How to Select the Correct Sling for Your Job

Start your sling selection by analyzing five factors:

1. The load—its size, weight, shape, finish.
2. Working area, amount of head room.
3. Size and type of crane hook.
4. Angle of sling legs.
5. Location and type of lugs or rings, if any.

This is basic information. From it, your supplier can recommend the sling by type, size and length that is safest, longest lasting and most economical for your job.

Types of Slings

Multiple-part slings are always recommended for heavy duty service, because for equal strength they are far more flexible than single-part slings. They hug the shape of the load easily, present a greater bearing surface to the load, and reduce the possibility of marring finely finished surfaces.

Where these factors are not so important, either Red-Strand ***single-part slings*** or ***grommet slings*** may be used for economy. Single-part Red-Strand slings are often recommended for lifting lighter weight objects, or those that have fixed attaching rings or lugs. Grommet, or continuous strand Red-Strand slings are ideal for forming hitches of various types without fittings.

How to Gain Extra Savings

Re-useable Pin-Lock thimbles reduce sling costs by 21%

Two suggestions will help you save money on slings.

The first is to re-use Pin-Lock thimbles on multiple part slings. They increase sling life by protecting loops from abuse or damage. Besides, these exclusive Leschen Pin-Lock thimbles cut sling costs on an average of 21% because they may be used again and again. They lock into sling loops with pins instead of permanent clamps, permitting re-use, and eliminating constant expense of thimble replacements.

The second suggestion is to use Red-Strand slings—for a very simple but good reason: Red-Strand slings are made of ***higher-than-rated*** quality Leschen wire rope that delivers ***longer-than-expected*** service.

Get a copy of Leschen's ***Sling Handbook*** for complete information. Ask your Leschen man for one, or write.

LESCHEN WIRE ROPE DIVISION
The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)
St. Louis 12, Missouri

LESCHEN
HERCULES Red-Strand
WIRE ROPE

used to anchor planes—could be embedded in the slab.

High Speed Paving

Concrete paving moved at a fast clip. The thick slab contains about 1.2 cubic yards of material per linear foot, and a good day saw 1,100 linear feet in place. In 109 working days, 110,000 cubic yards of concrete was placed, despite the fact that weather conditions sometimes did not permit a full 8-hour work day.

The portland-cement concrete was made with a 6.5 sack per cubic yard mix, using Type II cement, Darex air-entraining agent, and a 1½-inch-minus rock aggregate. Supplying the Koehring 34-E Twinbatch paver was a fleet of 5-batch trucks, a 3,000-gallon trailer-type water tank, and a 4,500-gallon truck-mounted water tank.

The paver, handling 37.4-cubic-foot batches, dumped the fresh concrete in the center of the lane where it was quickly spread. The first machine in the lineup was a conventional Blaw-Knox spreader. On this machine, the contractor had mounted a hydraulic Johnson bar from which ten Viber electric vibrators were suspended. These machines penetrated about 12 inches into the concrete. Next came a finishing machine which had a special Lewis alteration. The change-over from the conventional finisher was made by Hurst Lewis, of Pasadena, Calif. According to Lewis, the machine was developed to deliver a much smoother concrete surface mechanically through the use of a long wheelbase and an independent screed which was not attached directly to the frame of the machine.

The Lewis alteration, lengthening the wheelbase to 30 feet, achieves the same effect a landplane gives in smoothing agricultural fields. The machine has a tamping bar, independent screed action, side shoes along the wheels to prevent loss of concrete, and a belt finisher. According to Gordon Lilley, project engineer for the U. S. Army Corps of Engineers, the machine has particular advantages in hot weather.

Since the Corps of Engineers' specifications require supplemental finishing behind the machine, a small finishing crew followed the special machine. Two men worked long-handled longitudinal finishers; and two men, working from two wood bridges, operated a longitudinal float. Straightedge finishing, testing, and a light brushing of the lane edges followed.

The Techkote Co., Inglewood, Calif., sealed the concrete surface with its Sealtex white-pigmented curing membrane. The material was applied at the rate of one gallon per 200 square feet. Aiding the job were pickup trucks on either side of the slab on which were mounted the compressor, pressure pot, and curing-membrane drums. The material was sprayed onto the concrete through long-handled spraying units which reached more than halfway across the slab. The entire operation was handled by one man. Just 24 hours after a pour was completed, the form crew pulled the pins and moved the form ahead with the help of the small truck-mounted Hendy crane.

Contraction joints, 3½ inches deep and 18 inches wide, were spaced at 25-foot intervals in the pavement. In charge of this assignment was Cecil Hatcher, Arcadia, Calif. The job was handled by a special Concut Jointmaster gang saw, consisting of four Concut concrete saws driven by two heavy-duty Wisconsin air-cooled engines. Another Wisconsin engine drove the rig's travel gears.

In operation, the machine moved to a joint location, stopped, then sawed the joints while its wheels were temporarily blocked by wooden stops. According to the operator, Hatcher developed a new blade, the Foothill blade, which gave more service than any other blade he has used before. Even on green concrete, where abrasion is an even more serious problem than on seasoned concrete, it was common for each blade to give a good 3½-inch cut for 600 feet. On an average run, the machine cuts ten 25-foot cuts per hour.

After each joint was sawed, sand was laid across the top of the crack so that as water used in the sawing operation evaporated, the sand worked into the slot, sealing it temporarily against fine dust or dirt. Later, the sand was cleaned out by an air jet, and the Pioneer Flintcote jet-fuel-resistant compound was applied.

Sawing operations were kept close to the paving work to prevent shrinkage stresses and uncontrolled cracking.

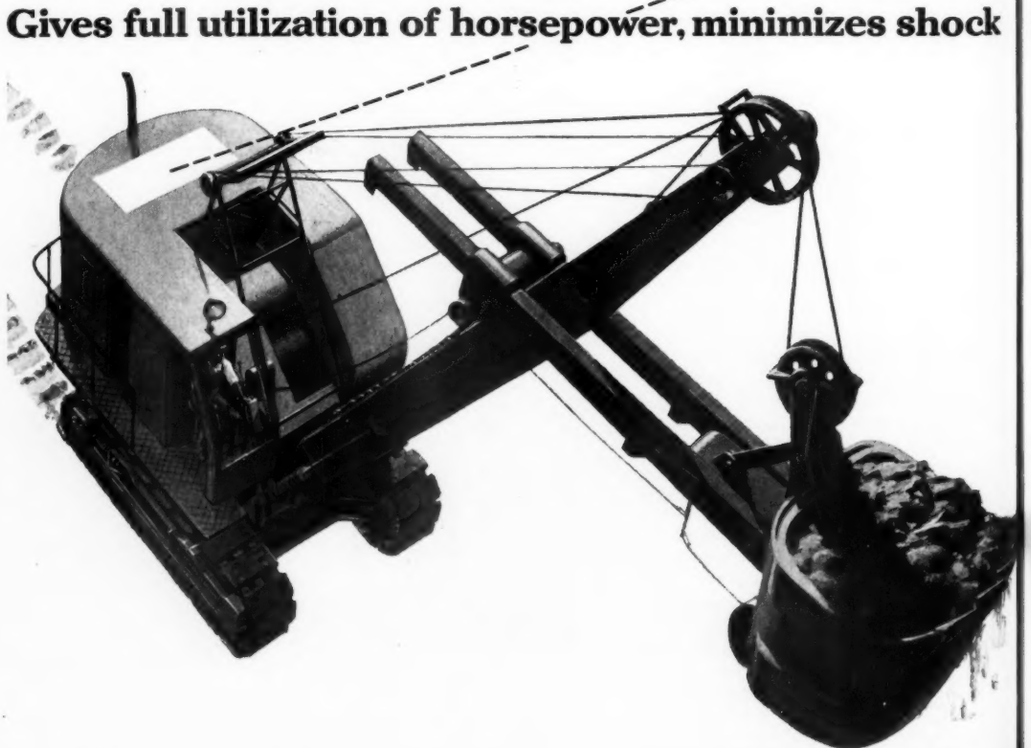
Aggregate Production

As with any other project where accurate costs are almost impossible to predict, a hard-luck unit showed up. For M-K and Westbrook, the unit was their rock-production setup. The concrete mix, originally set up for 3-inch-minus aggregate, was changed to a 1½-inch-minus aggregate after studies of the gravel pit location showed that 3-inch rock might not produce satisfactory concrete. With the mix design changed to 1½-inch-minus, the cement content was boosted to 6½ bags per cubic yard. This reduced the effective screening capacity of the rock plant, made more work necessary, and increased rock-production costs.

The rock plant handled about 300 tons of raw material to turn out 190 tons of acceptable concrete aggregates. Despite this, peak tonnages of 250 tph were turned out. The plant consists of a Pioneer 24 x 30 jaw crusher, a Telsmith Gyrasphere secondary unit, and the needed Symons vibrating screens. It is fed by a Northwest 95 dragline and a

Cummins Diesel - torque converter package speeds work cycle as much as 30%

Gives full utilization of horsepower, minimizes shock



fleet of White 10-yard dump trucks which haul materials to a point close to the feeder trap. Here, the raw material is pushed into the trap by a D8 dozer. The final product is trucked to the batch plant site and stockpiled in 3 piles over a feeder tunnel.

All aggregate entering the Conveyco manual-type batch plant was rescreened over vibrating decks so that all rock in the weight bins was right down the middle of specifications. Arizona portland cement, Type II, was used, and the Darex air-entraining agent was introduced from Darex drums through a dispenser on top of the mixer. An average of five batch trucks, each hauling 5 batches per load, were leased from Miles & Son, Merced, Calif., to shuttle between the batch plant and the job.

Personnel

All Corps of Engineers operations at the base were under the general supervision of the Los Angeles District Office of the U. S. Army Corps of Engineers, of which Col. Arthur H. Frye, Jr., is district engineer, and W. J. Leen, operations chief. Field engineering was under the supervision of Project Engineer Gordon Lilley, who was assisted by Harry Althaus, chief inspector.

THE END

Gar Wood Sales Manager

David Byrd has been made sales manager of the Richmond Division, Richmond, Calif., of Gar Wood Industries, Inc., Wayne, Mich. The division manufactures dump bodies and hoists. Mr. Boyd joined the Gar Wood organization in 1947.

Cellular Concrete Has Controlled Density

■ Control of density within two pounds per cubic foot is a characteristic reported for Aerofill, a new lightweight cellular concrete. This control is said to be maintained through a density range that extends from 20 to 100 pounds to the cubic foot.

Aerofill cellular concrete is made by a method in which water and a stabilizing chemical are transformed into a stable foam by a specially designed generator. This consists of a simple unit with a single valve control. The foam, composed of air cells of uniform size, is then added to a conventional mix of portland cement and sand in predetermined quantities. It is stated that while density is closely controlled in this manner, the relation of strength to weight remains constant and reproducible for any given density.

Aerofill, a new cellular concrete, can be placed by pumping. Sand or other aggregate does not settle out in the pump or hose.

The resulting lightweight cellular concrete has insulating and nonstructural uses. It dries quickly, due to low water content, and can be placed by pumping, either with a mechanical screw or an air pump, as the stabilized foam prevents the sand or other aggregate from settling out in the pump or hose.

For further information write to the Cellular Products Co., 1238 S. Atlantic Blvd., Los Angeles, Calif., or use the Request Card at page 18. Circle No. 413.

Data on Tow-Type Spreader

■ A trailer-type bituminous concrete and aggregate spreader is illustrated in literature from The Miller Spreader Corp., 120 Pike St., Youngstown 2, Ohio. The unit also spreads limestone, slag, gravel, cinders, and other materials used in driveway construction. A feature of the spreader is that the screed moves forward on an even plane, leaving a smooth and level surface for rolling, even though irregularities exist in the contour of the base.

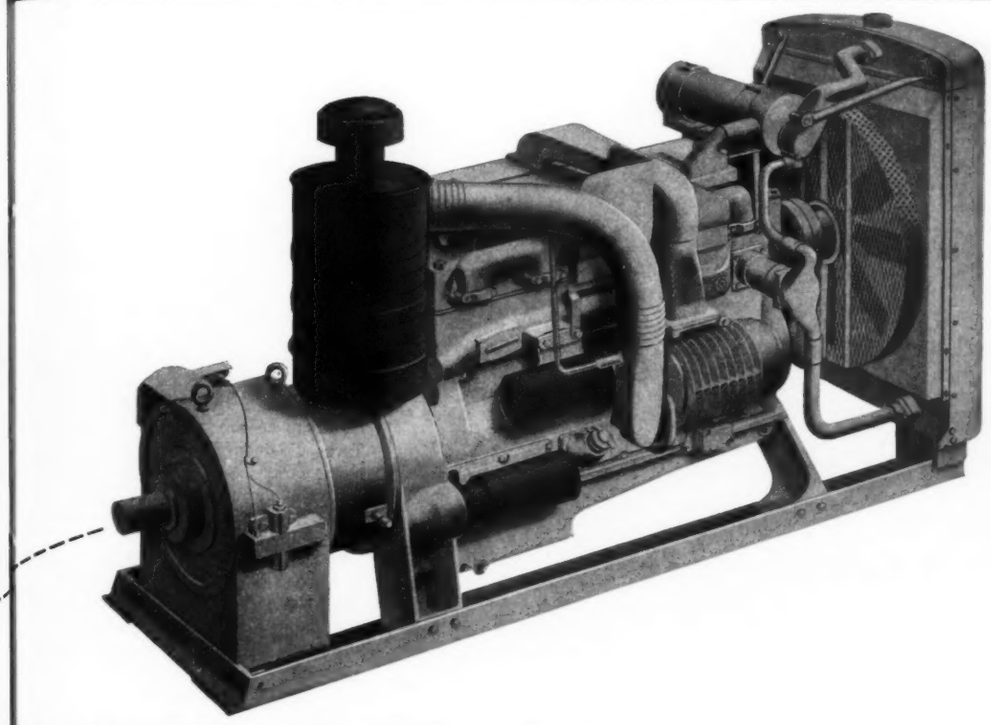
Sizes available are 8, 9, and 10 feet wide, with other widths offered on special order. Dual wheels are standard equipment. A bleeder plate fitted on each side of the spreader provides extra width and permits the operator to extend the spread 6 inches on either side. The unit spreads materials from ½ to 8 inches in thickness. Maximum capacity is 1 ton per minute.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 471.

Kocsis Is Service Manager For Barber-Greene Co.

Replacing Ralph Henricks as service manager for the southern area of the Barber-Greene Co., Aurora, Ill., is John Kocsis, who has been with the organization's manufacturing and service departments for the last 10 years. Mr. Kocsis will make his headquarters in the Atlanta sales office of the company, which manufactures paving equipment, belt conveyors, loaders, and ditching machines. He will be responsible for the service supervision of Barber-Greene representatives in Florida, Georgia, Alabama, Mississippi, the Carolinas, and Tennessee.

Mr. Henricks has been transferred to the company's general offices in Aurora, where he will take on research and other duties.



loads, adds to life of shovels, cranes, and draglines

Cummins Torque Converter Packages give smooth steady power over the entire digging or working cycle. Even where digging is the toughest and power requirements fluctuate widely, the Cummins Torque Converter maintains power without lugging, stalling or overspeeding. Crane work, too, can be speeded because loads can be handled more smoothly and accurately.

The output of the Cummins Torque Converter Package is measured by an output shaft governor which determines the exact amount of power required each instant and automatically matches engine speed to load requirements. This increases work capacity, adds to equipment life, saves fuel and engine wear.

Cummins Diesels, ranging from 60 to 600 h.p., equipped with one of many types of torque converters, can match any job you have. Available as replacement units or in many makes of new equipment.

CUMMINS

Cummins Engine Company, Inc.
Columbus, Indiana

Rugged diesel power (60-600 h.p.)

C208

Fast Truss Assembly Speeds Housing Job

Workmen use Ingersoll-Rand impact wrenches to tighten the bolts that close the joints of wood roof trusses. The use of Teco split-ring connectors speeded the prefabrication of the roof trusses for a housing project.

PREFABRICATION of wood roof trusses is speeding the construction of the Wherry Housing Project at Westover Air Force Base near Springfield, Mass. Nearly 4,000 Fink trusses, 28 and 30 feet long, are being assembled and erected by the Gilbane Building Co., Inc., Providence, R. I.

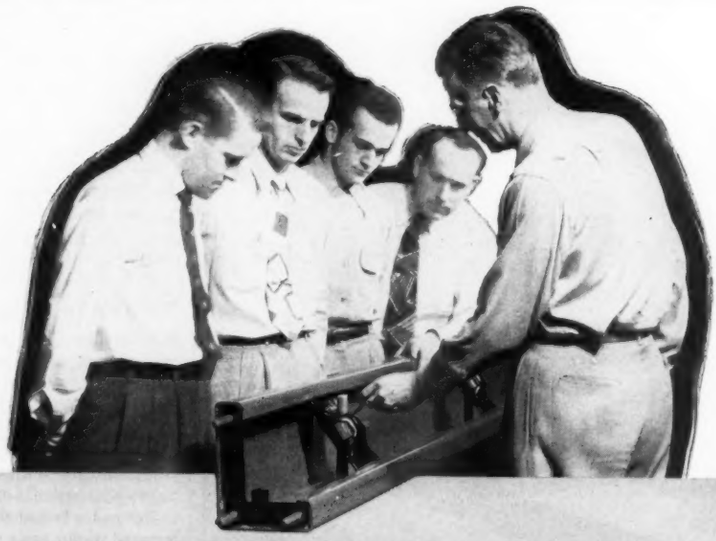
The typical housing unit contains four apartments and requires about 55 trusses placed 2 feet on centers. The top chords are single 2 x 6's on a 2 to 1 pitch. The bottom chord is a single 2 x 6 spliced at the center, and the struts and ties are single 2 x 4's. A 2 x 8 block is used at the double-joint connection in the top chord. The eight joints and bottom chord splice are made with single Teco 2½-inch-diameter split-ring connectors. Split-ring connectors increased the allowable load on the joints, permitting the use of small lightweight members.

Gilbane has organized the prefabrication work so that three men can assemble a truss every 7 minutes. Only four types of members are required, and these are precut at the mill. Bolt holes and circular ring slots are also made at the mill.

The pieces are trucked to the site and laid out on the ground around an outdoor assembly shop consisting simply of four wood horses. Workmen set the chord members in their proper position on the horses and then place the struts and ties on top. Split rings and ½-inch bolts are placed, and the joints are closed slightly by hammering. Workmen quickly tighten the joints with Ingersoll-Rand electric-powered impact wrenches and cut off any overhangs with a Porter-Cable power saw. The completed truss is picked up by hand and stockpiled as shown in the accompanying photo.

Because of their light weight, the trusses are erected by hand. Three-quarter-inch roof boards are placed on top and covered with shingles.

C. Gallotta is superintendent for Gilbane Building Co. THE END



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● The ability of Heltzel Forms to best fulfill these two basic functions is the big reason why they are preferred by leading contractors everywhere. For behind the Heltzel name is almost half-a-century leadership in the design and manufacture of steel forms. This "know-how"—has enabled Heltzel to constantly produce practical, workable, "form setter's" forms that set fast, align perfectly, hold steady and firm. And "Heltzel Built" means they're precision fabricated of special analysis carbon-manganese steel, pre-stressed to withstand heaviest loads without failure.

● The form illustrated above is the latest design of the popular HELTZEL DUAL-DUTY FORM. (Two forms in one for two different slab thicknesses.) It features extra-wide, two-way stake pockets and restyled end supports which add up to the strongest form in the field. The triple-prong slide locking arrangement and single direction wedging gives form setters perfect alignment with a minimum of effort.

● This long experience and constant experimentation make it just common sense to see the Heltzel representative in your area before you purchase form equipment. If you don't already have a complete file of Heltzel Form literature, use the coupon below.

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THE HELTZEL STEEL FORM AND IRON COMPANY • 5300 THOMAS ROAD • WARREN, OHIO

Vulcan Promotes Chase

Vulcan Iron Works, Chicago, Ill., has promoted Charles Hamilton Chase, to general manager of the Denver, Colo., plant. He was formerly assistant general manager. He succeeds R. A. Fox, who has retired but remains as a consultant to the company.

Tractor-Shovel Cabs

■ Its new line of operator cabs for all models of Hough Payloader tractor-shovels is announced by the Campbell Detachable Cab Co., Wauconda, Ill. These new cabs are detachable and are said to be of strong but lightweight construction with safety glass all around for maximum visibility and safety. The glass is cushioned and sealed in locking rubber channels. Ample room is allowed for the operator, and sliding side windows permit full ventilation when desired. The new cabs tilt up and sideward, allowing the operator to enter and leave easily.

Front and rear windshield wipers can be furnished. Heater-defroster units that improve operator visibility and increase comfort in cold weather are available.

The company also manufactures cabs for most other standard makes of crawler and wheel-type tractors.

For further information write to the company, or use the Request Card at page 18. Circle No. 474.

◀ Hough Payloader tractor-shovel with a new Campbell cab.

Warning Signal Stripes Are Self-Sticking

■ Diagonally striped warning signals in self-sticking tape form are new products of the W. H. Brady Co., 727 W. Glendale Ave., Milwaukee 12, Wis. The Brady warning stripes can be applied to dangerous equipment and in hazardous areas in place of hand-painted and stenciled signs. They are applied permanently to any clean dry surface without moistening. The warning signs are stocked on handy rolls 1, 1½, 2, and 3 inches wide. The user can choose from three color combinations including yellow and black stripes, black and white stripes, and red and white stripes.

For further information write to the company, or use the Request Card at page 18. Circle No. 446.

Replacement Cartridges For Engine Oil Filters

■ Five new lube and fuel oil replacement cartridges have been added to the line made by the Fram Corp., Providence 16, R. I.

Units available for various makes and models of tractor engines include a lube oil cartridge for the International Harvester CUB, and secondary fuel cartridges for Allis-Chalmers Models HD-15, HD-19, and HD-20. Also offered are primary fuel and lube oil cartridges for Allis-Chalmers Models HD-15, HD-19, and HD-20.

Fram manufactures more than 100 different types of replacement cartridges for a variety of filter-equipped gasoline and diesel engines.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 371.

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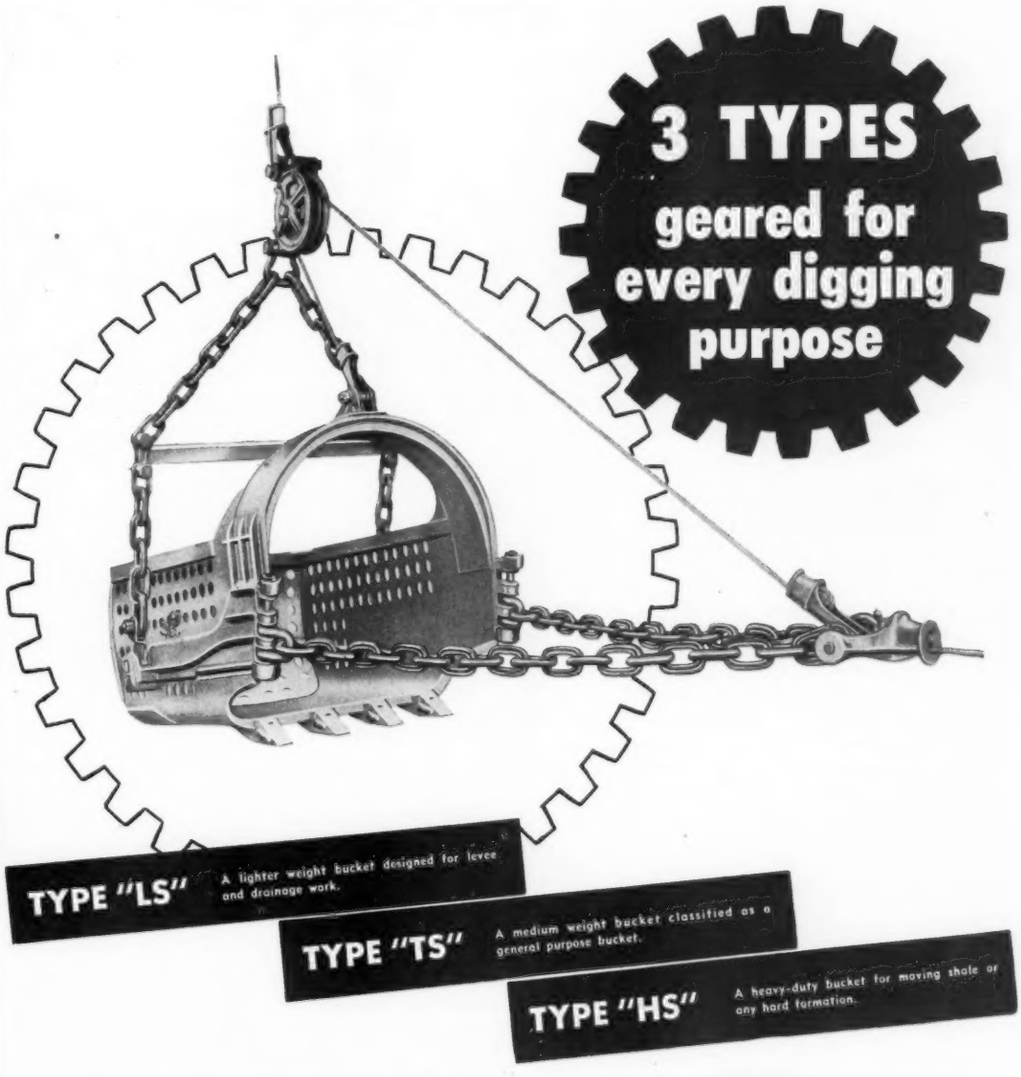
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Hendrix Buckets available without perforations on special order.

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

Davey Division Is Formed

A complete line of portable rotary drilling units, previously produced by Engineering Laboratories, Inc., Garland, Texas, will be manufactured by the newly established Davey Rotary Drill Division of Davey Compressor Co., Kent, Ohio.

The Davey organization, in purchasing manufacturing rights for the drill line, also acquired the complete inventory of finished drill units and service parts. The company now produces portable and stationary air compressors, pneumatic tools, truck power takeoffs, and mobile shops.

Trailer-Mounted Floodlight Unit

NITE-HAWK

MAKE NIGHT HOURS PAY with NITE-HAWK

Four 80,000 c.p. flood lights raise to 8½ ft.—aim in all directions. Control panel has duplex receptacles for extension light and power tool lines — voltage regulator — circuit breaker — fused circuits.

Tows at highway speeds on heavy-duty trailer with leaf springs—retractable caster wheel. This is the finest, most flexible unit available. Also low-cost, dependable 500 watt to 20 k.w. gas-electric plants.

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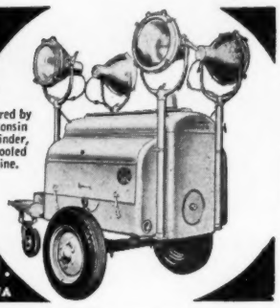

Powered by Wisconsin 4 cylinder, air-cooled engine.

WINPOWER MFG. CO.

TEL. 236 NEWTON, IOWA

The aluminum field office trailers offered by Contractors Trailer Co. are of heavy-duty construction.

Field-Office Trailers

■ A line of aluminum heavy-duty trailers is offered by the Contractors Trailer Co., 97 Eagle St., North Adams, Mass. Units featured are 28 and 35 feet long. The company stresses that these trailers are not converted from other uses but are specifically designed for use as field offices on construction projects.

The chassis of the CTC trailers is made of structural steel weighing 8.7 pounds to the foot. Steel angle cross members are welded to fit flat against the floor. Six-inch channel mains are electrically welded. The units have 2-inch drop-center axles with Timken roller bearings. Stewart-Warner electric brakes are on all wheels.

The trailer floor is undersided with weather-resistant insulating board. Seasoned 2x4's on edge are placed crosswise on 16-inch centers and bolted to the chassis.

The body, made of 2x4's placed on edge on 16-inch centers, is constructed with joints interlocked, mortised, and screwed. The exterior is made of .040-inch aluminum in large sheets, brake-bent for strength, appearance, and warp prevention. Aluminum rub rails run the full length of the trailer on both sides.

The interior is paneled with ¼-inch birch plywood, and has as many as 24 windows. A drafting table, a rack, storage shelves, and a closet are part of the equipment. Four movable desks are provided in each trailer. A special trailer heater offered is rated at 27,000 to 30,000 Btu.

For further information write to the company, or use the Request Card at page 18. Circle No. 425.

Aeroquip Promotion

Marvin W. Brandau has been promoted from industrial sales manager to director of market development for Aeroquip Corp., Jackson, Mich., manufacturer of flexible hose lines, self-sealing couplings, and fittings.

The new

PASSWORD

R-45 ROADRANGER®

8-speed transmission

Model R-45 ROADRANGER

Get these features: 1. No gear splitting—8 selective gear ratios, evenly and progressively spaced. 2. Easier, quicker shifts—38% steps—one shift lever controls all 8 forward speeds. 3. Higher average road speed—engine operates in peak hp range with greater fuel economy. 4. Less driver fatigue—1/3 less shifting. 5. Range shifts pre-selected—automatic and synchronized. 6. More compact than other 8-speeds. 7. More cargo on payload axle.

Around the terminals—on the docks—in the truck-stops and garages . . . the new password is ROADRANGER . . . the password to the greatest boost in truck performance ever offered. For the new R-45 ROADRANGER Transmission offers 8 speeds forward . . . shifted by a *single* lever!

This is the ROADRANGER Fuller designed specifically for engines in the 450-inch class—in the 125-160 hp range.

With 1/3 *less* shifting, and split-shifting entirely *eliminated*, the new R-45 permits *more* speed on hills, *better* control in traffic, *faster* round trips. *Specify* this great, new Transmission on *your* trucks . . . and you'll soon see why operators are saying "the new password is *ROADRANGER!*"

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Write for Catalog No. 320

SPRAGUE & HENWOOD, INC.

Dept. C, Scranton 2, Pa.

The Eveready BrikSaw Model E-15-PD concrete-cutting saw is self-propelled and moves forward at a controlled speed.

Concrete Saw Travels At Steady Forward Pace

■ A new self-propelled concrete-cutting saw has been announced by the Eveready BrikSaw Co., Dept. 234, 1509 S. Michigan Blvd., Chicago 5, Ill. The chief feature of the Model E-15-PD saw is that it moves forward at a controlled speed. Two abrasive-coated wheels act as a smooth positive friction drive to both rear saw wheels. This Powr-Drive is quickly engaged or disengaged by a foot lever control. A variable speed transmission can be infinitely regulated to drive the saw from speeds of 0 to 12 feet per minute.

According to the manufacturer, this arrangement results in increased cutting footage per day, less work for the saw operator, and increased blade life because of the smooth movement of the saw. More accurate cutting is another feature since the special drive tends to keep the saw cutting straight and true.

Powr-Drive is also available for installation on any other Eveready concrete saw. The kit comes completely assembled and requires only four bolts for installation.

The new Model E-15-PD saw also features Hydra-Eze blade control for lowering and raising the blade hydraulically without twisting or binding. Tri-Matic blade alignment, a floating-action undercarriage, reportedly prevents any binding, twisting, or tilting of the blade as the saw moves over uneven or broken surfaces. Other important features are dashboard controls, blade depth control, and a dual-blade shaft that permits placing the blade at either side of the saw for sawing in corners and confined areas.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 406.

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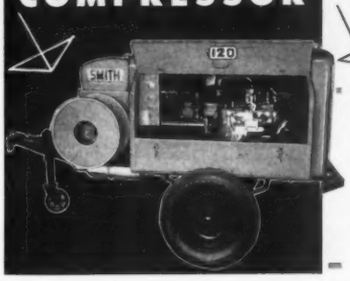
USE THE SMITH 120-P COMPRESSOR



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Be thrifty . . . *save* your big compressors for *big* jobs . . . then use the Smith 120-P for the majority of your compressor work. Heavy-duty Chrysler engine has 413 cu. in. displacement. Simple, compact compressor design—no coupling or clutch. Compressor pistons operate at 120° apart for smooth, even flow of air. Corrosion-free manganese bronze compressor valves with stainless steel discs. Finned aftercooler reduces air temperature approx. 200°, gives longer hose life!

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LITTLE GIANT CRANE & SHOVEL, INC.
1530 HOWARD DRIVE, DES MOINES, IOWA

This Cederapids plant, equipped with new Barber-Greene bins, prepared the surfacing material for the U. S. 63 widening project. Here a Bucyrus-Erie 22-B crane with Johnson ¾-yard clamshell bucket feeds the aggregates into the bin compartments. *C&E Staff Photos*

Asphalt Resurfacing Widens Old Pavement

A BITUMINOUS resurfacing job, during which foot-wide lip curbs on either side of a narrow concrete highway were covered over, added 2 feet of usable roadway to sections of U. S. 63 in Iowa. The operation thus made the full 18-foot width of the road available for traffic, where only 16 feet had been available before. And the extensive work involved in regular highway widening procedures was avoided.

Two lifts of asphaltic concrete, each 1½ inches thick, not only covered the curbs but eliminated rough spots as well. Two stretches totaling approximately 6 miles were resurfaced in Bremer and Chickasaw counties by the Iowa Road Building Co., Fairmont, Minn. The stretches were 7 miles apart. The contractor set up his plant at the junction of U. S. 63 and Iowa Trunk Highway 93 about 5 miles west of Tripoli and hauled to both jobs from the one setting.

Combine Two Plants

At the start of the 1953 construction season, the Iowa Road Building Co. purchased a new Barber-Greene plant to augment its old Cedarapids plant and permit the handling of more work. However, it was found that the new Barber-Greene hoppers were so well adapted to the 4-aggregate mix on this project that they immediately switched hoppers, using the old Cedarapids hoppers with the new Barber-Greene plant on another job where only a single aggregate was needed.

The Barber-Greene hoppers were set up to feed directly into the boot of the cold elevator. The first bin, containing fine and coarse sand, fed by gravity onto a conveyor belt through a calibrated gate. The belt passed under the other bin where crushed lime and limestone coarse aggregate were proportioned by a reciprocating feeder. The combined materials were then elevated to the

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FOR DEPENDABLE PROTECTION ON ALL HYDRAULIC AND OTHER LOW PRESSURE LIQUID CIRCULATING SYSTEMS

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A SIZE FOR EVERY NEED

Available for sump or line installation in capacities from 5 to 100 G.P.M. Choice of monel mesh sizes ranging from coarse 30 to very fine 200.

IMMEDIATE DELIVERY

Marvel not only delivers a top grade filter in both quality and performance but delivers IMMEDIATELY. If desired, shipments are made same day orders are received.

WATER FILTERS

In response to the great demand, we have adapted both our sump and line models for use in all water filtering applications.
No changes have been made in the basic synclinal design.

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Kroger supermarket in Glendale, Missouri. Architect: Cay Weinel, St. Louis, Missouri. Contractor: White Development Corporation, St. Louis, Missouri.

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Fast placing and erection . . . combined with modern design and strength make Laclede Steel Joists the answer to today's needs in roof construction.

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Producers of Construction Steel
LACLEDE STEEL COMPANY
St. Louis, Mo.

A sample of asphalt was taken each day by sawing out a 3-inch-square section with the diamond blade of a Felker Di-Met saw. Once a week a 12-inch-square sample was cut.

A Barber-Greene finishing machine lays the first 1½-inch course of asphaltic concrete over the old pavements. Note that the lip curb still projects. A second course completely covered the curbs. A Galion 8 to 12-ton tandem roller compacts the mix as it is laid.

Two 1½-inch bituminous courses cover foot-wide lip curbs on narrow Iowa highway, increasing size of traffic lanes

dryer; thence carried via the hot elevator to the gradation and proportioning units of the Cedarapids plant, and finally to the skip which deposited them in the pugmill for mixing.

With the addition of an extra baffle plate, the capacity of the 1-ton pugmill was increased to 2,400 pounds, and a very satisfactory mix resulted. This modification effected a considerable increase in the plant output but required a larger power unit.

An effective dust collector was a must on this job in order to meet the mix specifications. The cyclone-type collector on the Cedarapids plant did a good job, returning the dust to the bottom of the hot elevator and eliminating practically all dust from the stack.

Homemade Oil Preheaters

Another factor contributed materially to the elimination of black smoke and dust usually produced by a portable asphalt plant. This was the use of preheaters to heat the No. 5 burner oil to a temperature of approximately 250 degrees before it reached the burners.

The heavy fuel oil was stored in a 6,000-gallon storage tank equipped with coils and steam heated to a temperature at which it could be readily pumped. After being passed through the pump, the oil was further heated in job-built preheaters which consisted simply of a ¾-inch oil line jacketed with a 3-inch steam line.

With more than 100 pounds of live steam pressure in the jacket, the oil became so hot that it vaporized instantly and completely as soon as it left the burner nozzle. The result was an extremely hot flame with practically no smoke and a substantial saving in oil consumption.

Steam for all purposes at the plant was supplied at more than 100 pounds pressure by a Cleaver-

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Before you approve the blueprint for your next model — double check to make sure it includes the latest improvements you can build into your product with the right type and size ROCKFORD CLUTCH. It will pay you to consult our engineers concerning technical clutch advances that will give you and your customers the advantages of better power transmission control.

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Shows typical installations of ROCKFORD CLUTCHES and POWER-TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications.

ROCKFORD CLUTCH DIVISION BORG-WARNER
▲ 314 Catherine Street, Rockford, Illinois, U.S.A. ▲

ROCKFORD CLUTCHES

Powered by a two-drum hoist mounted on a tractor stationed on a highway rise, this Sauerman Crescent Scraper is doing a "first-rate" job of cleaning a drainage channel.

For similar operations, such as cleaning under culverts, removing silt from storm sewers or working in places where head room is too limited for other machines, the Crescent-tractor combination gives you the same versatile efficiency at low investment cost.

The Crescent, working between an anchorage and the hoist, will deposit excavated material anywhere along the span simply by reversing the forward pull. Through an opening no larger than its own width, the Crescent can be started through an underpass. It digs equally well on firm ground, boggy material or under water.

For complete information on this and similar projects send for Field Report 209, Crescent Scrapers with Tractors and Catalog J.

More "Hows" to tough problems:*

How To Trench Across A Stream—Field Report 219
How To Clean Under A Bridge—Field Report 209
How To Dig Under A Building—Sauerman News 137
*Available on request

To find out "How" your particular problem can be handled, consult Sauerman's engineering dept.

SAUERMAN BROS., Inc.
564 S. Clinton St., Chicago 7, Illinois

Brooks 160-hp boiler using the same No. 5 fuel oil as the dryer burners.

The site selected for the plant proved to be soft and wet when the plant was moved in. Ties used for jacking up the units sank into the ground and disappeared. Rather than use an excessive amount of timbering and run setup costs too high, Project Superintendent Robert Reed set the plant at a low elevation. This required an unusually deep pit in which to load the trucks. The pit was dug a foot deeper than necessary, and a 1-foot lift of blacktop was put in the bottom. A good solid footing resulted, and no difficulty was experienced getting trucks in and out even when the weather was wet.

Aggregates were handled from stockpile to hoppers by a Bucyrus-Erie 22-B crane using a Johnson ¾-yard clamshell bucket. Aggregates were received by truck from a commercial supplier, Beu & Sons, Grundy Center, Iowa. An Allis-Chalmers HD-7 tractor with dozer kept the stockpiles within reach of the crane at all times. An Allis-Chalmers HD-9 was used around the plant for loading materials and doing other miscellaneous work.

Asphalt cement was received from the refinery in tank cars and trucked to the plant. At the plant, a Kinney 3-inch transfer pump powered by a Wisconsin engine pumped the asphalt to storage tanks. This same pump was used to transfer fuel oil and cutback asphalt used for tack coat by an arrangement of valves and piping.

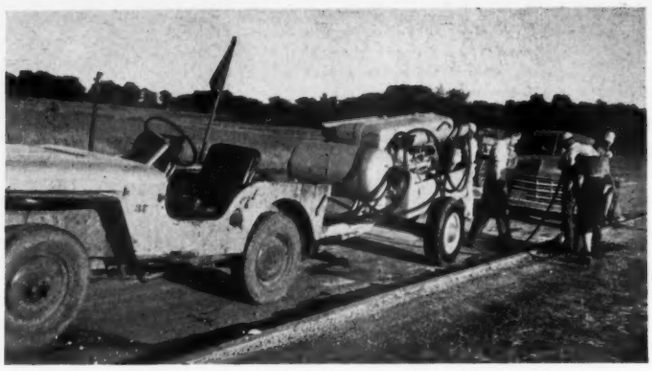
Traffic Is Problem

On the road, one of the big problems was to keep traffic flowing on the highway at all times. Standard procedure in Iowa, as in many other places, is to station a flagman at each end of the section under construction and permit one way traffic through the section. A red flag is carried by the last vehicle in each group, indicating to the flagman at the other end that the way is clear. Some difficulty was experienced with drivers who turned off on a side road before reaching the other flagman or who drove through without leaving the flag. Tying the flag to a heavy wire hoop about a foot in diameter subsequently eliminated most of the difficulties.

The first step in the resurfacing was to patch holes in the old pavement. Old blacktop patches and areas of poor concrete were removed by Thor hammers supplied with air by a Jaeger 125 compressor. The holes were carefully filled with the same hot-mix being used in the surfacing, and the material rolled with a 5 to 8-ton Huber roller. Broken portions of the lip curb were carefully replaced with the asphaltic material, compacted with a pneumatic tamper.

A very light tack coat consisting of 0.06 of a gallon per square yard of RC-O grade cutback asphalt was applied by an Etnyre distributor and immediately covered with a blotter-coat of sand. A Weston lime spreader applied the sand. The road was opened to traffic immediately after application of the sand.

Before the first lift of surfacing was applied, the roadway was carefully swept with a power broom to remove all loose sand and other dirt.



Broken sections of the lip curb are repaired with bituminous mix which is compacted with a hand pneumatic tamper before asphalt is laid. Air is supplied by a Jaeger 125 air compressor towed by a jeep. The project did not interrupt traffic.
C&E Staff Photo

A Barber-Greene finisher then laid the 1½-inch mats which were rolled by both a Galion and a Huber 8 to 12-ton tandem roller. Nine 2-ton trucks were hired to haul the mix from the plant to the finisher.

Samples Are Sawed

Laboratory checks of the mix were made at regular intervals from samples sawed out of the mat which had been laid the day before. A 3-inch-square sample was taken each day and supplemented by a foot-square sample once a week. The Felker Di-Met concrete saw which made the cuts to obtain these samples was also used each day to saw a vertical edge at the end of the previ-

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With Koehring excavators and cranes you gain an important profit advantage in extra work capacity. There are some simple ways to check this. Take lift capacities. Obviously, the machine with heaviest lift capacity rating not only picks up larger crane loads — it has more power and stability to increase shovel, dragline, or clamshell production. Be sure to check this and other clear-cut measurements of "KOEHRING WORK CAPACITY". Your Koehring distributor has all the facts . . . see him soon.

lift capacities up to 79½ TONS . . . ½ to 2½ YARDS dipper capacities

ous day's work to insure a good starting joint.

Each phase of the work was carefully inspected by the Iowa highway engineers. At the plant, inspectors Robert Clites, Carroll Oelke, and Clarion Torkelson kept a sharp eye on the gradation, weights, and other plant features, while Walter Schnurr, Kenneth Huber, and Joseph Martin looked after the work on the road. Resident engineer was G. W. Fiddick. These projects were located in District 2 of which R. R. Zack, Mason City, is district engineer. E. F. Koch is chief engineer for the Iowa State Highway Commission.

The contractor employed approximately 26 men. Robert Reed was project superintendent. Valdor Eckholm supervised the plant operations, and Russell Silvers looked after the laying operations. THE END

Centrifugal-Type Pump

■ A new 2-inch centrifugal pump is announced by the Jaeger Machine Co., 550 W. Spring St., Columbus, Ohio. Officially rated at 10,000 gph, the new Model 2PN Jaeger Sure Prime actually pumps all the water that can be pulled through a 2-inch suction line under average pumping conditions. According to the manufacturer, a 28-inch vacuum at the intake is not unusual. The pump delivers its rated capacity when operating at the speeds of from 2,400 to 2,550 rpm.

This pump is both light and compact. Mounted on 13-inch-diameter pneumatic tires, it weighs 190 pounds and measures 24 x 21 x 26 inches high. Without tires, it weighs 160 pounds.

A Wisconsin AKN engine, delivering 5.3 hp at 2,500 rpm, contributes to the pump's performance. Other features are combined inherent and jet priming, a self-cleaning shell of 20 per cent steel, a positively lubricated shaft seal, a reversible liner plate, and an impeller that is adjustable for wear.

For further information write to the company and request Catalog P-4, or use the Request Card at page 18. Circle No. 461.

Power-Control Unit

■ A new medium-duty rear-mounted power-control unit has been announced by Gar Wood Industries, Inc., Customer Service Department, 36253 Michigan Ave., Wayne, Mich. The Model 261 is designed for dozer or scraper work with tractors rated from 40 to 130 hp.

The new power-control unit has planetary-type gearing, and starts and stops are reported to be smooth. The cable drum is sensitive to small variations in control lever movement, so that a minimum hand pull is required. Controls are needle-bearing mounted for maximum operating ease. Whenever a lever is released, it returns automatically to the neutral or holding position.

A compact fairlead spools cable on drums in level even layers by oscillating instead of sliding sheaves. The fairlead assembly is antifriction-bearing mounted.

The band-type clutches and brakes on this unit have large surface areas. Their outside location serves to dissipate friction heat and makes them accessible for service and adjustment. Only four simple adjustments, one on each clutch and one on each brake to take up for wear, are needed to keep the unit working. Clutch and brake drums can be removed for overhauling without disassembling the entire unit or removing it from tractor.

The cable drums have a large bare drum diameter. Line pull for the bare drum is 5,000 pounds, while full drum pull is 2,600 pounds. The drums handle 268 feet of ½-inch cable. Including the new Model 261, Gar Wood now offers three cable-control units.

For further information write to the company, or use the Request Card at page 18. Circle No. 462.

Marlow Opens Texas Plant

Marlow Pumps, a division of Bell & Gossett Co., with headquarters at Ridgewood, N. J., has established a new branch manufacturing plant at Longview, Texas, for the production of the complete Marlow line of pumps.

The company's plant in De Queen, Ark., will be closed and all operations transferred to the Texas plant. Service facilities will be available at Longview, where a balanced stock of parts and pumps will be maintained.

Johnson 50 to 125-yd. Roadbuilders plants

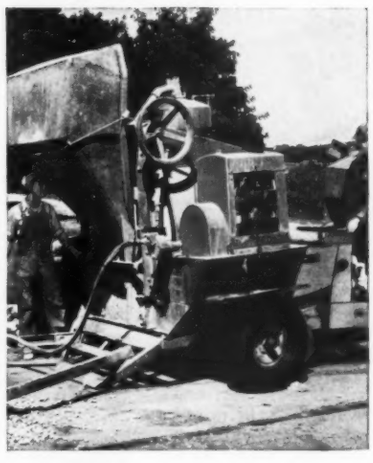
Flexible All-Welded Roadbuilders Bin gives you a portable batch plant for 2, 3 or 4 aggregates, or converts to transit-mix (shown) or central-mix plant for bulk cement and 2 or 3 aggregates. Can be equipped with 1 or 2 multiple material Hi-Speed Batchers, size 34 Roadbuilders Batcher, or truck-mixer charging batcher in 2, 3 or 4-yd. sizes. Bin available with 2, 3 or 4 compartments, 50 to 125 cu. yds. Also: silos, elevators, buckets.

C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)

7-second discharge with Kwik-Mix 11-S

Saving important seconds on every batch of concrete, tilted Flow-Line Discharge Chute pours full 12.1 cu. ft. batch in 7 seconds. Kwik-Mix 11-S Dandie® also has side or end discharge, 2 or 4 wheels, and special tower attachment. Other sizes: 3½-S to 16-S. Also check Kwik-Mix bituminous, tilt and non-tilt plaster-mortar mixers . . . and Moto-Bug® (power wheelbarrow) shown here. Ask your Kwik-Mix distributor for all facts.

KWIK-MIX • Milwaukee, Wis.
(Koehring Subsidiary)



17½ feet per minute with 202 Trenchliner®

On utility, drainage and irrigation trenching, you can dig up to 17½ ft. per min., 13 to 31 in. wide, in depths to 6 ft. with this 202 wheel-type Trenchliner. It has: square or round-bottom buckets; quick-change bucket fronts with cutting lips or "Tap-In" teeth; 16 or 20-in. crawler shoes; gas or diesel engine. Tile box and chute optional. Also check 215 wheel-type; 3 big ladder-types, full crawler mounted; utility Trenchliner on rubber.

PARSONS • Newton, Iowa
(Koehring Subsidiary)

270

Gravel to be used in building up a county road is loaded into a truck by a Lorain 40 shovel. Boulder is establishing gravel stockpiles throughout the county for use in its new road program.
Ray Day Photo

Change in Organization Aids County Maintenance

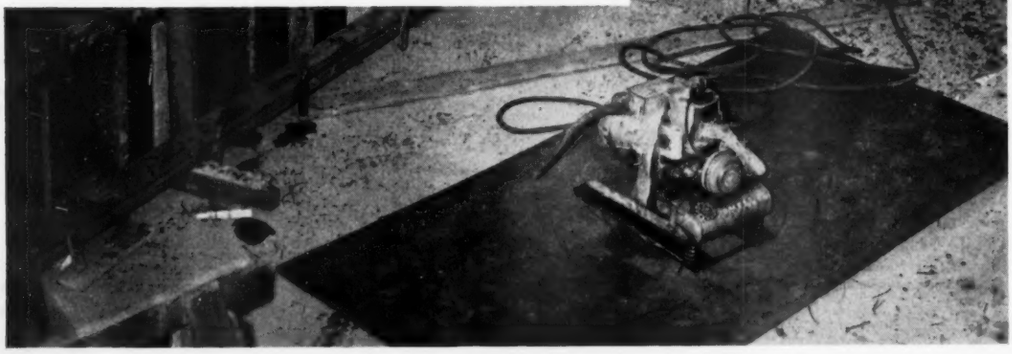
Relieved of secondary-highway work by new legislation, a Colorado county embarks on a revitalized road program

With Homelite Carryable Generators . . .

contractors are now operating cost-cutting, labor-saving, one man high cycle electric concrete vibrators. Note the absence of special staging normally required for both operator and gas-engine powered vibrators. The Homelite generator stays on the ground, out of the way of the actual pouring operation and is easily moved to any spot where needed. Homelite generators also provide power for money-saving electric drills, saws and floodlights. For complete information, write

HOMELITE CORPORATION

5905 RIVERDALE AVENUE • PORT CHESTER, N. Y.



RECENT LEGISLATIVE action, turning the maintenance of about 3,600 miles of secondary highways in Colorado over to the Department of Highways, has caused a major revamping of the Boulder County maintenance and highway programs. Now, relieved of the job of taking care of 144 miles of road while still retaining its modern maintenance and construction equipment, Boulder is set to launch a healthy road program backed by a larger maintenance and road-building budget.

Boulder is particularly fortunate as far as the allocation of state road funds is concerned. The county, containing several large towns and including range country and mountains, has traffic that is urban, tourist, and land access. County road funds are based on road mileage, population, and a "factor of difficulty" which allows a larger allocation to counties which must build and maintain roads in mountainous areas. Boulder County, with a "factor of difficulty" of 2.52 under this formula, is close to the 3.0 limit. In calculating the county's appropriation, the 600-mile road system is multiplied by 2.52, which means that from 20 to 30 per cent of its $600,000 maintenance and betterment budget comes from the state. The balance comes from a road levy against real estate and personal property.

Another change calls for all counties to employ a road superintendent so that construction and maintenance departments can be centralized for greater efficiency. This change has been made mandatory by law. Now directing highway maintenance for the county is D. N. Stewart, who was maintenance engineer of the state highway department until his retirement last year. With this new setup, Boulder has a

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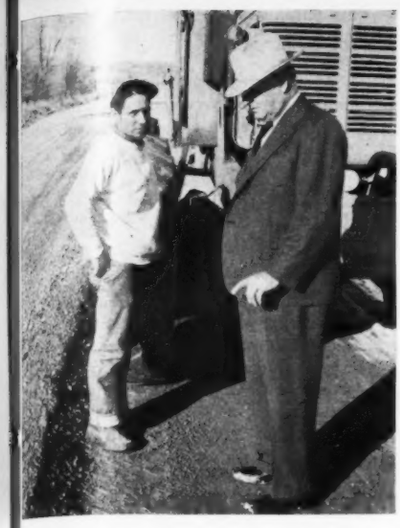


D. N. Stewart, road superintendent for the county, talks over a maintenance problem with one of his crew members.
Ray Day Photo

A gravel highway is reshaped and small windrows of loose gravel worked into the roadbed by the Galion motor grader, while a light blanket of snow provides the ground with moisture. *Ray Day Photo*

centralized headquarters, with only a small shop at Longmont, to replace the commissioner organization.

This major reorganization has been in the making for the past several years. With the counties plagued by demands for better roads and road maintenance from a public which has grown economically more interdependent, such a change was inevitable.

Under the old system, Boulder was kept so busy maintaining state secondaries that modern standards could be developed on only about 20 per cent of its 600 miles of road. As a result, about 120 miles of county roads are of the higher-type bituminous surface, while the remainder is of improved gravel construction. Right-of-way widths average about 80 feet, with 60 feet a minimum average. On these roads, traffic counts of 1,000 cars per day have been made.

Work Started

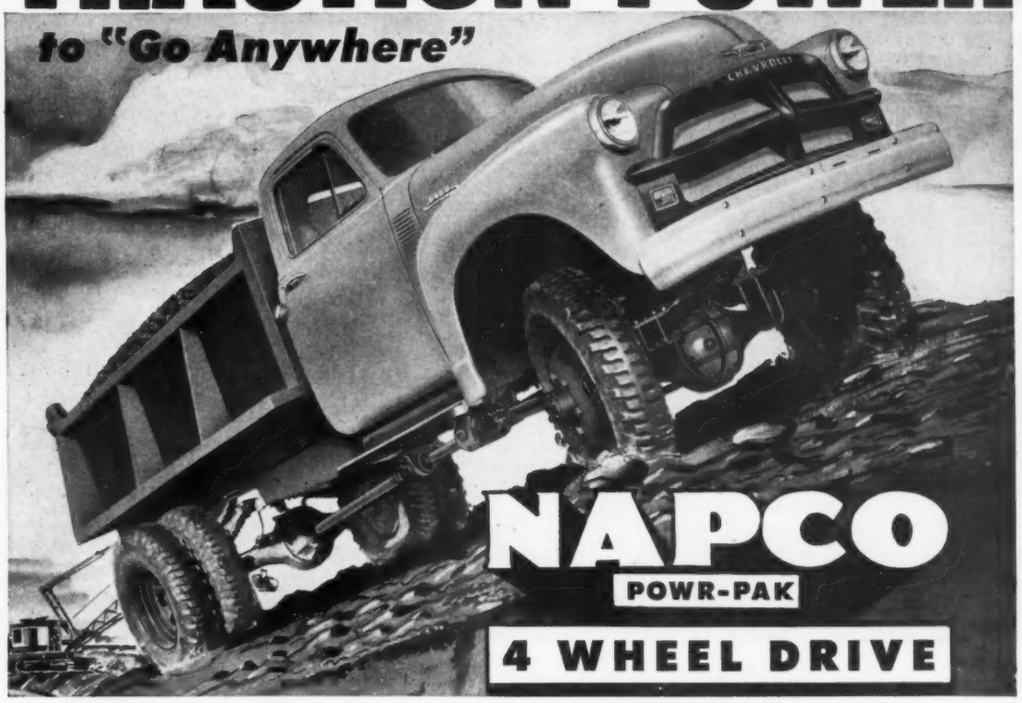
In the process of streamlining operations, the county staff has been reduced from 75 to 45 men, but it will be built up again as conditions dictate. At headquarters, Stewart has assigned a foreman and four heavy-duty mechanics to the shop. He plans on having a paint shop, an equipment-wash facility, and a pump island and oil house in the main yard. Insofar as it is possible, Stewart wants all maintenance done mechanically to reduce costs.

While routine maintenance will be of the modified patrol type, several specialized outfits—crushing, oiling, hot plant, and bridge maintenance-repair crews—will operate on a county-wide basis. Betterment jobs will be planned for a 24-foot minimum roadway, with curvature and sight distance based on Bureau of

(Continued on next page)

TRACTION POWER

to "Go Anywhere"



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A *new improved model* of the same military-type 4 wheel drive chosen by the U. S. Armed Forces for the hundreds of thousands of Chevrolet trucks used throughout the world during World War II.

Utilizes Standard Replacement Parts
Because all replacement parts for the entire differential of the front axle assembly are available at any Chevrolet dealer, many of the maintenance problems formerly associated with 4-wheel drive units for Chevrolet trucks have been solved.

Standardizes Your Fleet
Chevrolet trucks equipped with the NAPCO 4 wheel drive remain unchanged except for the addition of the Powr-Pak itself. No special maintenance stock of parts is needed.

See our specifications in the **CCJ** Truck Specifications Section—April issue.

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CHEVROLET TRUCKS

UTILIZING STANDARD REPLACEMENT PARTS

Now, for the first time, you can buy a Chevrolet truck, world's best truck value, equipped with NAPCO Powr-Pak, world's most proven* 4-wheel drive. Your local Chevrolet dealer can order your new Chevrolet truck equipped with the NAPCO Powr-Pak, or can convert trucks of your present fleet.

NAPCO's Powr-Pak gives your Chevrolet trucks the extra traction power to "go anywhere" . . . over rough terrain, through ice and snow, mud and sand! It reduces costly "down time" . . . it enables you to keep bigger payloads rolling whether it's over highways or across tough "off the road" terrain.

What's more, NAPCO Powr-Pak equipped Chevrolet trucks give you all the ease of handling features you've always wanted. At high speed operation over highways there's not a trace of whip or weave . . . no fighting the wheel. And, when the going gets tough "off the road," just a flip of a lever gives you finger tip control of the extra traction power necessary to get bigger payloads through on schedule. The normal easy turning and handling characteristics of Chevrolet trucks are not affected by the NAPCO Powr-Pak installation.

See your Chevrolet dealer, or write for complete information! The low cost of a completely equipped Chevrolet 4-wheel drive truck will surprise you —hundreds of dollars less than any 4-wheel drive in comparable capacity.

NAPCO PRODUCTS DIVISION
NORTHWESTERN AUTO PARTS CO. **834 N. 7th St., Minneapolis, Minn.**

(Continued from preceding page)

Public Roads formulas.

The immediate objectives of the county are to maintain its good roads and to improve or reconstruct the ones which are bad. This work has already begun. Sharp curves are being straightened, old wooden culverts are being replaced with corrugated metal and concrete pipe, gravel stockpiles for future subbases are being established throughout the county, and crews are being trained for optimum efficiency.

High-Type Paving

The best in construction and maintenance methods govern the new program. Subgrade materials are being examined carefully by either visual or laboratory methods. Old subgrades are being strengthened by sheepsfoot rolling, ripping, and if necessary, rebuilding. In every case, they are shaped to insure positive drainage.

Within the past few months, miles of vital drainage ditches have been improved and cleaned. Two of the most useful county machines for this work are a DoMor loader, which mounts a Caterpillar No. 12 motor grader, and a loader for a Galion motor grader.

New granular subbases, from 8 to 18 inches thick, will be checked to keep the PI as low as possible. This material is put down by blade mixing with moisture and pneumatic rolling. Topping these bases will be 3 to 4 inches of 1-inch-minus crushed material, well graded, with an adequate amount of 200-mesh fines and binder material. Over this, enough crushed mineral aggregate will be placed to make a 2-inch mat of road-mix bituminous cake. SC-3, SC-4, and some MC-3 are being used for this work. General policy calls for a seal-coat of RC-4 and ½-inch-minus chips. Shoulders will be built up with gravel or light asphalt-penetration treatment. For this bituminous job, motor graders and a Wood Roadmixer are being used.

For the most part, hot-mix asphaltic concrete pavement, using 150 to 200 penetration asphaltic cement, will be laid between centers having a high traffic count. About 50 miles of new high-type county highways are expected to be constructed during the current season.

Maintenance Methods

While operations under the new setup have just begun, outstanding results have already been achieved in maintenance. As soon as the first fall rains and snows began, motor-grader operators were kept busy reshaping the county's gravel highways. In this operation, the original crown on the gravel road was kept intact so that drainage remained adequate. At the same time, small windrows of loose gravel, unavoidable in dry seasons, were reworked into the roadbed. Maintenance of bituminous surfaces will entail a considerable amount of patching and seal-coat work.

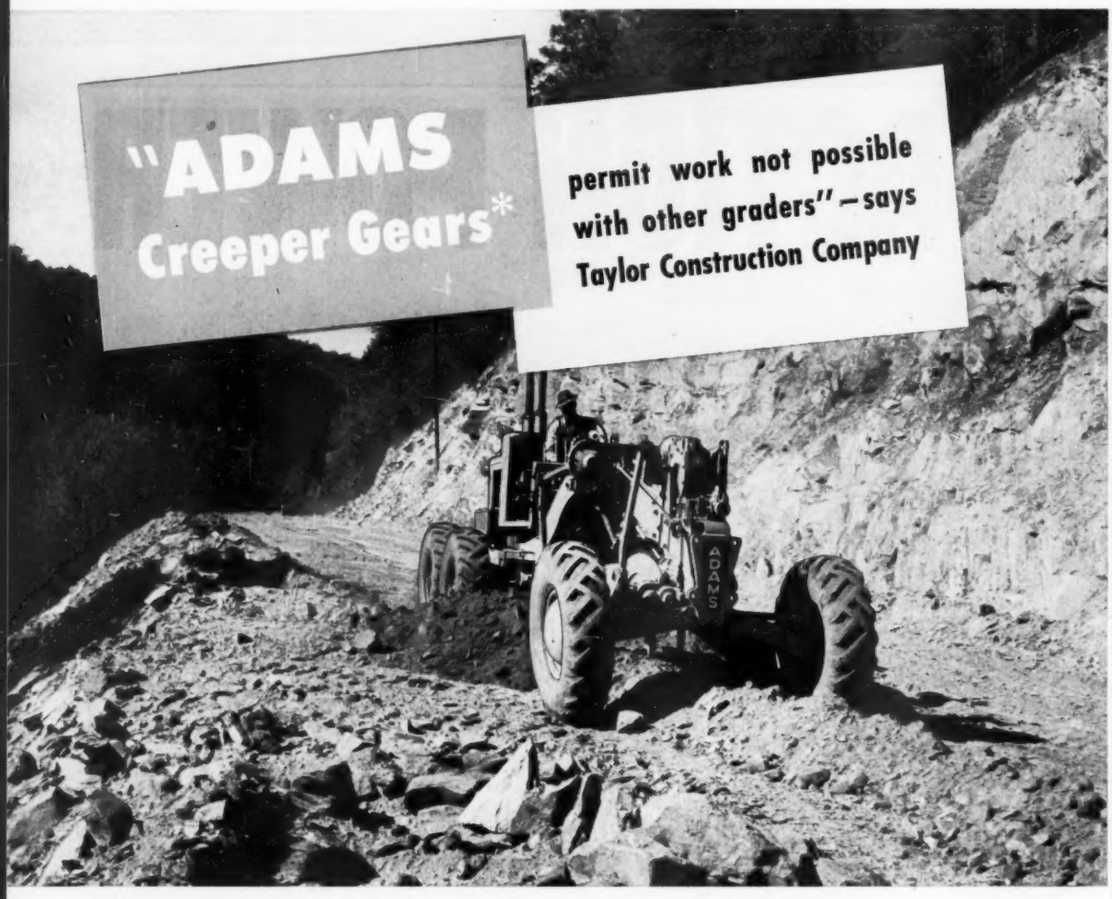
For the county's intensified weed-control operations, mowing and chemical spraying will be used. Soil around bridge abutments and guard-rails is about to be sterilized. At the other end of the scale, snow-removal methods and equipment are being re-evaluated. Boulder County already owns many push-plows which are used on both trucks and motor graders, as well as the heavy V-type plow used on motor graders. But Stewart believes that the county has need of a rotary for occasional use through cuts which may become packed too tight for even a V-type plow to loosen.

Tying up the year-round program are the gains being made in employee education. Stewart, with his background of experience with virtually all highway maintenance problems, can often be found in the field working on county maintenance schemes with his men.

To implement the new county program, the organization has an unusually good roster of equipment. Included on it are 65 trucks of various types, 17 motor graders, 2 Lorain cranes equipped with drag booms and shovel front-ends, a truck-mounted "Quick-Way" machine, a Hough Payloader, a Case ¾-yard Lull Shoveloader, a Caterpillar D4 with Traxcavator front-end loader, a second Case tractor with an older Hough loader, a Barber-Greene bucket-type loader, a Littleford 1,250-gallon distributor, and a Rosco 1,000-gallon asphalt distributor.

There is a 1,000-gallon supply tank, a 4,000-gallon semimounted supply tank, a Huber tandem steel roller, a Grace pneumatic roller, 6 tractors and dozers (including Caterpillar, International, and Allis-Chalmers machines), two International trucks with low-bed trailers, a Cedarapids 9 x 36 and 24 x 24 crusher, a Universal crushing plant, and a Barber-Greene finisher. An asphalt-producing unit, good for the production of 30 to 40 tons per hour, includes a Barber-Greene hot-mix plant which consists of a Model 840 pugmill and a Model 839 dryer.

With this equipment and through the reorganization which has taken place, the county hopes to bring to



"The heavy construction of the machine and the wide range of speeds, make our Adams Motor Grader adaptable to many varied conditions. On a heavy rock job in Tennessee (pictured), the low creeper gears allowed us to work under conditions other graders could not match." Thus reports Baxter Taylor, Taylor Construction Company, Asheville, N. C.

Adams Improved Motor Graders have many operating advantages which contribute to their greater work capacity—such as *8 Regular Forward Speeds, With High Transport Speed; 4 Reverse Speeds; Dual Braking System; Foot Accelerator.*

For a new experience in motor grader performance, ask your local Adams dealer for a working demonstration. Convince yourself that Adams Motor Graders are to-day's best buy.

J. D. ADAMS MANUFACTURING CO., INDIANAPOLIS, INDIANA

*** ADAMS Creeper Gears (Optional)**

Provide speeds from ¼ to 1¾ mph.

MILES PER HOUR		1	2
CREEPER SPEEDS	1st		
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Permit gearing grader to extra-low-speed work—as in working in rocky soil—without sacrificing power. Operator is not tempted to slip clutch—tire slippage is practically eliminated—shock loads are materially reduced . . . Also advantageous on fine finishing work.

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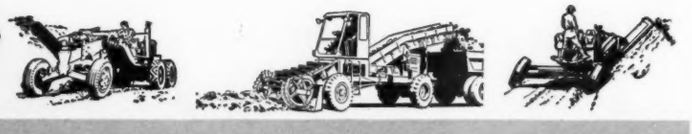


Motor Graders TraveLoaders Pull-Type Graders

realization plans for a highway system with 24-foot bituminous roads the rule rather than the exception. Groundwork for the county's modern program has already been done, and Stewart and the commissioners he serves have made a special effort to emphasize that the setup owes much to the organization it supplanted. With the original organization still largely intact, the county is planning a highway program that will keep pace with the needs of its expanding population and industry.

Personnel

As road superintendent, D. N. Stewart is responsible to the Boulder County Board of Commissioners, which is headed by W. D. McCaslin and has A. W. Thurston and L. C. Austin as members. THE END

Form Coating Resists Damage, Weathering

■ A new protective coating for concrete forms is made by L. J. Kissling & Sons, P. O. Box 21, 5-49 49th Ave., Long Island City, N. Y. Technicote B-5009 reduces form damage due to handling, weathering, and concrete action. The coating is said to be resistant to chipping, cracking, and abrasion, and minimizes adhesion at the concrete and form interface. According to the manufacturer, the coating does not deteriorate if it is exposed to moisture, temperature changes, or the rays of the sun. If properly applied, the coating is said to make the plywood form waterproof.

Technicote B-5009 contains no grease, oil, or wax. It gives the concrete a smooth even surface and eliminates the expense of surface finishing. Forms need only to be brushed or hosed down after stripping or prior to resetting. The material covers about 250 square feet per gallon.

For further information write to the company, or use the Request Card at page 18. Circle No. 366.

Buckets and Grapples

■ Construction features common to all of the buckets and grapples that it produces are shown in literature from the Owen Bucket Co., Breakwater Ave., Cleveland 2, Ohio. The booklet also makes recommendations on selecting the proper type of bucket for each kind of service.

Specifications and performance features are listed for the company's Type M general-purpose buckets, Type K and Type S material-handling buckets, and Types D and DX heavy-duty buckets for excavating and dredging hard material. Also shown are drawings of attachments including standard teeth, corner teeth, side teeth, and counterweight jackets.

The literature also contains information on the company's three and four-line industrial buckets and on special buckets made for particular services or unusual installations. Also shown are rock and scrap grapples in ratings from one to 25 tons. A feature of these grapples is that all four tines function independently of each other.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 458.

Adjustable Shores Have Locking Features

■ Burton's all-steel shores that feature locking at any desired height are now available through the Patent Scaffolding Co., 38-21 12th St., Long Island City 1, N. Y. Designed to be easily carried, installed, and adjusted by one man, the Burton shore features a slotted adjusting pin guide and permits the addition of 8 or 14-inch U-heads without dismantling.

For rough adjustments, the shore provides adjusting holes, 5½ inches apart. Close adjustments are made by turning the 8-inch-long handle of an adjusting collar. The adjusting collar locks in position at any height, providing safety and tamper-proof service. Installation is accomplished by raising the inside tube to the approximate height, inserting the steel pin into the nearest adjusting hole, and then turning the handle for a close final adjustment.

Standard Burton's shores have 7 x 7-inch base plates and 7 x 7-inch heads. It is not necessary to remove the square plate to fit the 8 or 14-inch-long U-heads into the top of the tube. The shores are available in four sizes ranging from 9 feet 10 inches to a fully extended length of 16 feet.

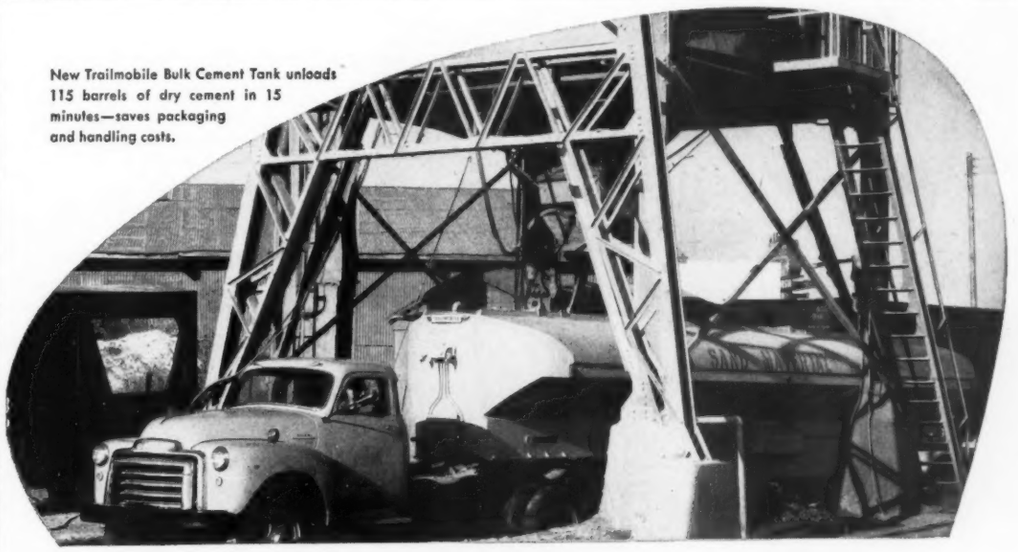
For further information write to the company, or use the Request Card at page 18. Circle No. 391.

Mechanics of Materials Is Issued in New Edition

The third edition of "Mechanics of Materials", by Philip G. Laurson and William J. Cox, has been published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

While retaining much of the outlook of the previous editions, the book places increased emphasis on the statics of stress determination and the postponement of material on stresses determined by deformation. The chapter on combined stress has been rearranged to give increased emphasis to Mohr's Circle.

Other changes include a revision of the tables of structural shapes, the inclusion of a number of new illustrations, and the addition of a series of new problems. The first 14 chapters deal with principles and methods used in the design of ordinary structural and machine parts, while the later chapters are concerned with specialized matters. The book can be ordered from the publisher and sells for $5.75.



New Trailmobile Bulk Cement Tank unloads 115 barrels of dry cement in 15 minutes—saves packaging and handling costs.

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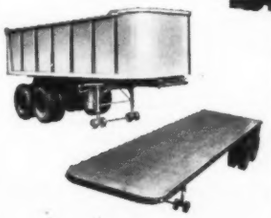
TRAILMOBILE TRAILER

TRAILMOBILE TANK TRAILERS for water, oil, gasoline, kerosene, asphalt, bulk cement, aggregate, liquid petroleum gas.

TRAILMOBILE STEEL AND CORRUGATED VANS for loose freight, tools, storage, mobile field office and miscellaneous equipment.



TRAILMOBILE DUMP AND FLAT BED TRAILERS. Dump trailers can handle capacities up to 25 cubic yards. Flat beds are available in almost any length and capacity for hauling lumber, steel, piping, oversize machinery and concentrated loads.

You'll find rugged, hard-working Trailmobiles on job sites everywhere—hauling materials and supplies for construction of bridges, buildings, roads and dams. They serve as mobile storage units and field offices, too. There's a Trailmobile for almost all construction needs.

Several kinds of trailers may be pulled with one tractor—that means substantial savings.

Check the yellow pages of your 'phone book for address of your nearest Trailmobile Branch, or write:

TRAILMOBILE INC.

The Trend is to TRAILMOBILE

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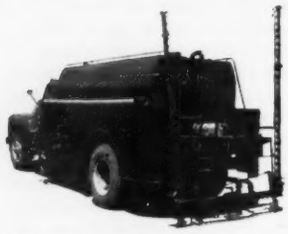
Ask TRAILMOBILE—Hundreds of types, sizes and makes of good used trailers available for prompt delivery.

New Cartwright Distributor Bars Give Balanced Pressure With No Drip



Shown at left is a 1250-gallon Precision Distributor. Write for bulletin describing this most advanced equipment and the new Cartwright Circulating No Drip balanced pressure spray bars.

SD Model at right has been designed particularly for city use and to meet a limited budget without sacrificing performance.

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Use a FLINTKOTE Coating
for years of heavy-duty protection

Flintkote makes you a *complete line* of spray, brush or trowel applied coatings for water, dampness and corrosion control . . . each designed for *specific* protection requirements, inside and out.

One of these products, and a good name to remember, is Flintkote HYDRALT® . . . multi-purpose industrial asphalt emulsion coatings, fibrated and non-fibrated.

HYDRALT Protective Coatings are unique mineral colloid asphalt emulsions which provide a durable, thick film *reinforced within itself.* Will not sag, flow or crack. Cold-applied over metal, masonry and insulation materials.

Is resistance to oil, grease and other petroleum products a problem? Then use Flintkote ORTAR† Emulsion Coating, a coal tar product.

You'll find complete details about all Flintkote protective coatings in Sweet's Catalog. Or write us.

† Trade-mark of The Flintkote Company

Over 50 years specialized experience at your service . . . by phone, mail or personal call. No obligation.

FLINTKOTE
Products for Industry

THE FLINTKOTE COMPANY, *Industrial Products Division,* 30 Rockefeller Plaza, New York 20, N. Y.; 55th & Alameda Sts., Los Angeles, Calif.

The Flintkote Company of Canada, Ltd., 30th Street, Long Branch, Toronto, Canada

A Testing Screen for Crushed-Stone Samples

■ A mechanical testing screen for sizing test samples of crushed stone, gravel, slag, coal, ores, and similar materials is offered by the Gilson Screen Co., 119 E. Market St., Mercer, Pa. The Gilson test screen accommodates up to one cubic foot of sample, making from two to seven separations simultaneously in five minutes or less. Smaller amounts of very fine materials may be handled efficiently, and the screen may be used for research or other special mass-separation jobs down to 100-mesh or finer.

The Gilson mechanical testing screen.

The equipment consists of a starting switch with overload relays, a ¼-hp capacitor-type motor, and a roller and ball-bearing driving mechanism mounted on an outer frame.

The vibrating unit is suspended on four springs and centered top and bottom in the outer frame. It is made up of a number of interlocking spacers which support and separate the screen trays. The unit holds five screen trays and a dust pan. An additional screen tray may be added by placing the dust pan in stationary position under the vibrating unit. If fewer separations are desired, one or more screen trays may be left out. Two or three turns of the tightening rods fasten or release all trays.

The whole unit is 33 inches high, 23 inches wide, and 31 inches long. The screen trays are 3 inches deep.

For further information write to the company, or use the Request Card at page 18. Circle No. 460.

Automatic Transmission for Heavy-Duty Trucks

■ The use of two Hydra-Matic truck transmissions combined to form one unit has extended the application of this automatic transmission to heavy-duty GMC trucks, according to the GMC Truck & Coach Division, General Motors Corp., 660 S. Boulevard, East, Pontiac 11, Mich. It was announced that the Twin Hydra-Matic would first be placed in GMC diesel Model DFM-660-47, a cab-over-engine highway tractor rated at 60,000 pounds, gross combination weight. It will be available in other 150-hp models later, and eventually will be engineered for use in conjunction with GMC's gas and diesel power plants in the 175 to 225-hp range.

The Twin Hydra-Matic consists of an upper and lower unit mounted one over the other and governed to shift alternately with each other, through seven forward speeds and one reverse speed. Both units are geared together at the rear, driving a single output shaft which connects to a 3-speed reduction unit. This combination of Hydra-Matic and reduction unit provides automatically the gear shifting required under varying conditions throughout three separate ranges: creeper, low, and direct.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 341.

NO STOOP, NO SQUAT, NO SWEAT

PAT. PEND.

WHEN YOU USE THE **Hoffco** CLEARING QUARTETTE

2 H.P. POWER UNIT $123.00

Clear weeds, brush, saplings ANYWHERE, with the revolutionary Hoffco Quartette. Fast, easy, economical! Attach cutting head—put Hoffco to work! YOU stand upright, relaxed. Thousands SOLD, thousands PROVED! Write for complete information.

Sawette
Chain saw levels growth, even trees, up to 8" diameter. Sawette head $64.50.

Scythette
Clears weeds, brush, ¾" saplings. Operates under water! Scythette head $39.75.

Trimette
For close trimming. Circular blade spreads mulch evenly. No raking! Trimette head $59.75.

Brushette
Removes stubble, 3" dia. trees. Guarded 10" blade protects operator. Brushette head $59.75.

ALL PRICES F.O.B. FACTORY

Hoffco, inc. RICHMOND, INDIANA

The new Osgood-General Model 250 is a crawler-mounted machine rated at ¾ cubic yard.

New ¾-Yard Excavator Is Crawler-Mounted

■ A new ¾-cubic-yard crawler-mounted excavating machine has been announced by Osgood-General, P. O. Box 515, Marion, Ohio. The Model 250 is designed to meet the increasing requirements of counties, towns, cities, and other supervising bodies for public works projects, as well as those of small contracting jobs.

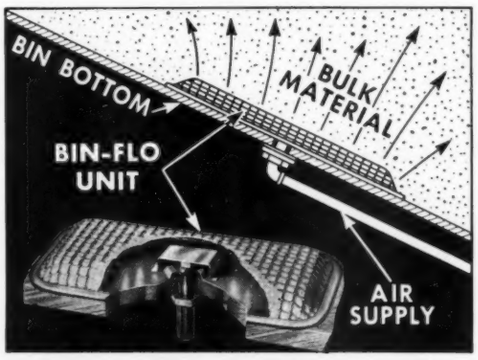
The operating machinery is mounted on a one-piece cast-steel deck constructed to withstand continuous operating strain. The horizontal shafts are held in rigid alignment through steel machinery side frames mounted on machined pads which are integral with the deck. This arrangement is said to prevent weaving and misalignment.

The swing and travel motions are actuated by spiral bevel gears and machine-cut teeth, which operate in oil, and by large air-cooled band-type clutches. Deck gears, bands, and chains are covered for safety and clean operation. Lubrication is led to inaccessible points by tubing. There is liberal use of antifriction bearings.

The cab covers the entire machine, provides the operator with room to work, and gives him a full view. The shovel boom, of all-steel welded box-type construction, is 17 feet long. The handle is of the inside type and is 15 feet long. A lattice-type boom for crane, dragline, and clamshell service is all-welded, has tubular lacings, and is flange connected. The standard boom length is 35 feet, with inserts of 5, 10, 15, and 20 feet available. Two-piece jibs, 10 feet long with 5 and 10-foot inserts, are also available. A pin-connected boom which may be folded is optional equipment. The hoe boom is 16 feet 6 inches long, with a 6-foot 10-inch arm.

The machine is powered by either a gasoline or diesel engine, and Continental engines are standard equipment. Over-all length of the crawler is 11 feet, with standard 22-inch-wide treads; 36-inch-wide treads are optional equipment. The weight of the machine as shovel and hoe is approximately 36,000 pounds.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 370.



BIN-FLO USES SMALL VOLUME OF AIR AT LOW PRESSURE

KEEPS BULK MATERIALS MOVING

BIN-FLO units in bins, chutes, hoppers, etc., restore flow characteristics to dry, finely ground materials which tend to pack or bridge in storage. Types for all materials and conditions. No moving parts; simple installation; negligible operating cost; no maintenance cost.

BIN-DICATOR bin level indicator—"The Eyes of the Bin"—automatically reports levels of materials in storage; automatically controls filling machines; prevents waste.

NEW 20-PAGE BOOK FREE

THE BIN-DICATOR CO.
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New Dormitory Lewis and Clark Campus, Portland, Oregon, Donald M. Drake Company, Gen. Con.

Pouring Second Lift of High Wall with Symons Forms

24' wall poured in two lifts with Symons Forms. Scaffolding attached to forms makes easier setting and stripping of top forms. Note absence of bracing and minimum waling.

Send plans for your next job and get complete layout and cost sheet—no obligation. Catalog F-9 sent FREE upon request. Symons Clamp & Mfg. Co., 4251-E4, Diversey Avenue, Chicago 39, Illinois.

WELLMAN STONE GRAB

Moves the "big ones" faster!

THE Wellman Stone Grab thrives on rugged work. This tough grab is built with three jaws for gripping big, irregular-shaped stones with speed and safety. Develops tremendous closing force in its jaws. Welded construction and alloy steels give great strength with minimum dead weight. Available in 5, 10 and 15 ton sizes.

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CLEVELAND 4, OHIO

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Please send me a free copy of bulletin on:

☐ Clamshell Buckets ☐ Stone Grabs
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Your Name_____
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Position_____ Company_____

Refinery Is Built as

Using Ingersoll-Rand tampers powered by a Jaeger 600-cfm compressor, workmen compact around the base of the coagulating tower of the water treatment plant.
C&E Staff Photos

DISCOVERY OF OIL in the Williston Basin of North Dakota has initiated a boom in construction activity in that area. As drill rigs pierce the earth seeking more oil, and pipeline crews string their threads of steel tube to transport the precious fluid, the entire area is taking on a new atmosphere. Towns and cities are mushrooming. The expanding population requires construction of new homes, schools, and hospitals, and expansion of utilities. Businessmen are talking of locating new industries in this area, which heretofore had an agricultural economy based primarily on wheat and cattle.

At Mandan, across the Missouri River from the capital city of Bismarck, one of these new industries is already taking shape. The Standard Oil Co. is building a new refinery there, designed to process 30,000 barrels of crude oil per day. The plant is scheduled to go into production late this fall.

General contractor for the refinery is The Lummus Co., New York, N. Y., specialist in engineering and construction for the oil and chemical industries throughout the world. Principal subcontractors include a joint venture of Albert LaLonde Co., Inc., Sidney, Mont., and Norgaard & Hilling, Williston, N. Dak., on the grading. Arrowhead Steel Buildings, Inc., Duluth, Minn., is erecting the steel frame buildings. Chicago Bridge & Iron Co. and General American Transportation Corp., both of Chicago, Ill., are fabricating and erecting the many steel storage tanks.

Varied Grading Jobs

On April 9, 1953, ground was broken on the 1,000-acre site which lies north of the city limits on a gently sloping hillside well above the flood level of the Missouri River. The grading contractors moved in a fleet of equipment including 5 Caterpillar D8 tractors using 3 Cat 80 scrapers and 2 LeTourneau scrapers, and 3 Cat DW10 tractors with scrapers. Two Cat D8's push-loaded the scrapers, and a D7 with dozer maintained the dump areas. Two Caterpillar No. 12 motor graders maintained haul roads and did finishing as 2 D4 tractors with Bros sheepsfoot rollers compacted the fills.

One of the first grading projects was for the construction of 3 miles of railroad spur from the Northern Pacific railway into the plant site. Ballast and track were placed by

JOB AFTER JOB, FRANKI FOUNDATIONS
SAVE TIME, TROUBLE and MONEY!

Original foundation specifications for a modern catalytic cracking unit for Socony-Vacuum's East St. Louis Refinery called for 30-ton pre-cast concrete piles. The Lummus Co., of New York City, the consulting engineers, substituted Franki Displacement Caissons because extremely heavy vertical loads and high up-lift conditions *had* to be met.

A total of 119 Franki Displacement Caissons were installed, each providing a vertical load capacity of 120 tons and up-lift resistances up to 50 tons per unit. The Franki method made it possible to greatly reduce the cap concrete and install the foundation to shallower depths. Result: *The Lummus Co. saved valuable time, trouble and materials, and Socony-Vacuum saved $30,000!*

Write to Franki Foundation Co., 114 E. 40th St., N. Y., for brochure describing Franki Methods and "Franki Facts" on this job.

FRANKI METHOD SAVED...

U. S. AIR FORCE
Limestone, Maine
$200,000

PALISADES HOUSE
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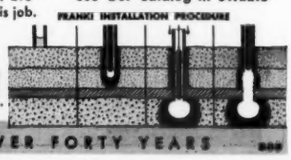
PITTSBURGH COKE & CHEMICAL CO.
Neville Island, Pa.
$20,000

McWILLIAMS FORGE CO.
Rockaway, N. J.
$10,000

U. S. CORPS OF ENGINEERS
Tobyhanna, Pa.
$7,500 ... *to name a few!*

See Our Catalog in SWEETS

FRANKI INSTALLATION PROCEDURE



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FOUNDATION COMPANY
NEW YORK, N. Y.
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FIRM FOUNDATIONS FOR OVER FORTY YEARS

Don't Let Water Stop You!

The Manu-Mine organization can help you solve your difficult ground water problems through its contracting and consulting service. Specialists in:

1. Stopping the flow of water through walls, foundations, geological strata, etc., by chemical soil solidification
2. Stabilization of soils around foundations and footings
3. Water reservoir rehabilitation and construction
4. Ground water studies
5. Geological and mining studies
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Let us know your problem and we'll be glad to discuss it with you. Call or write:

Manu-Mine Research & Development Co.
P. O. Box 167, Reading, Pa. Telephone: 4-2778

...as Oil Field Opens

Storage and treatment facilities and 350 miles of pipeline are part of the newest addition to new oil-processing network

A foundation for a building in the power-plant area is excavated by a Michigan Model C-16 ½-yard backhoe. The Lummus Co., New York, N. Y., is general contractor for the new Standard Oil refinery. *C&E Staff Photos*

the railroad company crews. Outside the main plant area, a diversion ditch was constructed to lead surface water around the plant. Access roads into Mandan and throughout the plant area were graded and given a gravel surfacing. In the completed project, there will be about 5 miles of road with a 6-inch gravel surfacing, in addition to a main trucking road about ¾ mile long which will have a 10-inch gravel base and a 3-inch bituminous surfacing. A spacious parking lot will be surfaced with gravel.

Grading the plant site included construction of a 20-acre lagoon for the settling and purification of waste water, as well as a general leveling of the building area. Around each storage tank, an area was diked with earth embankments for fire protection. The dikes were built wide enough to be used as roads, and ramps were built on both sides of the walls so that vehicles could drive to and from the diked areas.

The steel storage tanks rest on bases of compacted gravel surrounded by rings of concrete or asphalt-mix. Concrete rings for the 21 largest tanks are 14 inches wide and 4½ feet deep. Inside these

(*Continued on next page*)

SOIL-AIRE

ROLLPAC

Ruggedly built for heavy-duty service

$895.00

A Standout Popular-Priced One Ton Roller. Send for Catalog.

SOILAIRE INDUSTRIES

Minneapolis 3, Minnesota

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2 Big Extra Values for you!

...in JOY SILVER STREAK ROCK DRILLS

1 EXCLUSIVE! **CADMIUM PLATING INSIDE and OUT**

Cadmium plating prevents rusting of JOY Silver Streak Rock Drills and spare parts while in use or in storage. In addition, the plating forms cadmium oxide under frictional heat and pressure. This so effectively acts as a lubricant that the inner parts will not score, *even if regular lubrication is temporarily neglected!* In addition to assuring a smooth "run-in," cadmium plating allows closer tolerance of precision fitting parts—vital factors in the power and long life of the drill.

2 EXCLUSIVE! **JOY DUAL VALVE "Makes Air Do More Work"**

The fast, powerful JOY Dual Valve action results in more and harder-hitting piston strokes per minute, for faster drilling with less air. The right amount of air is admitted behind the piston on the power stroke, and air is excluded ahead of the piston, to exert maximum force on the drill steel. Then the Dual Valve meters just enough air ahead of the piston to return it with a fast, snappy action for the next blow. The air actually does more work!

W&D C 4026 Over 100 Years of Engineering Leadership

Consult a Joy Engineer

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

(Continued from preceding page)

rings, pit-run gravel fill was placed in lifts of not more than 10 inches and compacted with Jackson vibratory units. Footings for smaller tanks consist of compacted gravel bases resting on undisturbed ground with a ring of bituminous mixture 3 inches thick and 3 feet wide around the edge.

The grading contractors produced 40,000 cubic yards of gravel for tank bases and 35,000 cubic yards for road surfacing from a pit about 6 miles from the job site. Here a Pioneer crushing and screening plant turned out material with a maximum 1-inch size at a rate of 1,200 cubic yards per 10-hour day. Two Caterpillar tractors, a D8 and a D4, dozed the gravel from the pit to a trap which fed a 30-inch Pioneer conveyor belt 50 feet long. The gravel was carried to a buzzer screen with 5-inch-square openings where a large amount of oversized material was rejected. Gravel passing the buzzer was picked up by another 30-inch x 50-foot Pioneer conveyor and carried to the crushing and screening plant. The 10 x 36 jaw crusher and 22 x 40 rolls of the plant reduced the remaining gravel to minus 1-inch size. Power for the crushing and screening plant was supplied by a Caterpillar D13000 diesel engine.

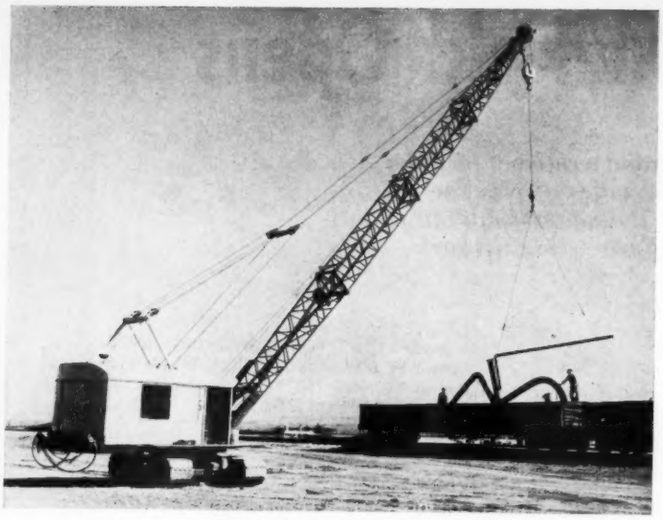
Although Standard Oil Co. owns a site containing about 1,000 acres, the facilities now under construction occupy only about 200 acres. However, an area of roughly 400 acres was enclosed by a 6-foot Cyclone fence after grading operations were completed. The fence was furnished and erected by the Cyclone Fence Department, American Steel & Wire, in Minneapolis, Minn. The 24,000 linear feet of chain-link fence is topped with three strands of barbed wire. Guardhouses are located at gates so that unauthorized persons can be prohibited from entering during construction.

Water Supply

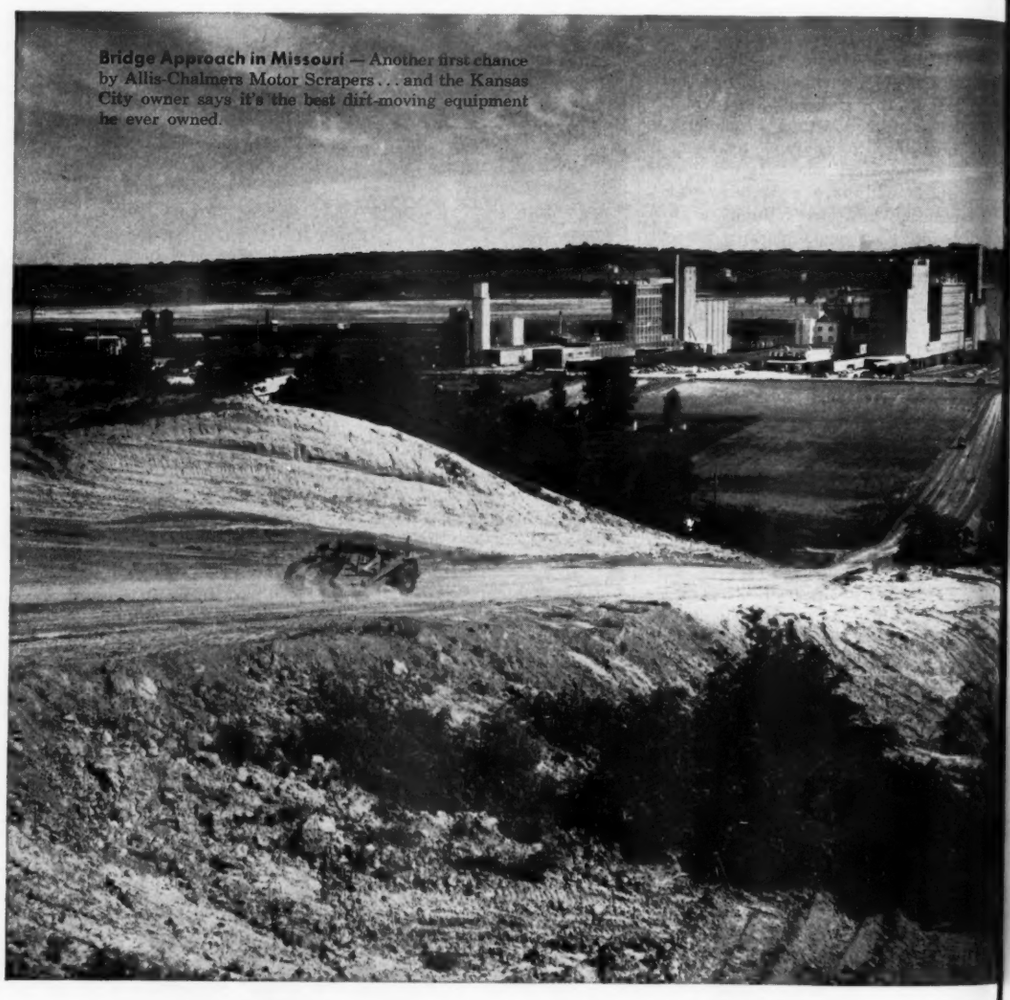
Availability of an adequate water supply was one important factor in the selection of the Mandan site. When in operation, the refinery will require about 25,000,000 gallons of water per day. Raw water from the Missouri River will be clarified and treated in the water-treatment plant. For economic reasons, a Fluor cooling tower will be used. A substantial portion of the water will also be re-used so that the entire requirement will not have to be pumped from the river.

The water-distribution system includes a network of steel pipe from 6 to 30 inches in diameter. The raw-water line from the river is a 16-inch line; 30-inch lines join the refining unit and the cooling tower, and the remainder of the system is a grid of 6, 8, 10, and 12-inch lines. All are welded steel pipe and will carry a normal pressure of 60 psi. A maximum of 175 pounds pressure is allowed for in emergencies. A storage tank 100 feet in diameter and 48 feet high provides emergency storage in case of breakdown or fire.

Stationary turret nozzles, located at about a dozen strategic points throughout the plant, add to the fire protection facilities, and 47 fire hydrants assure that water will be available for fighting fires. Domestic



Fabricated pipe for the refinery is unloaded from a gondola car by a Lima Model 750 crane. The plant, which is designed to handle 30,000 barrels of crude oil daily, will go into operation this fall.
C&E Staff Photo



Bridge Approach in Missouri — Another first chance by Allis-Chalmers Motor Scrapers . . . and the Kansas City owner says it's the best dirt-moving equipment he ever owned.

Today's Contractors are Keen Judges of Equipment

On earth-moving jobs all over the country, design, performance and service features that were once taken for granted are now getting a careful look . . . because even one extra yard per load, one extra mph. on the haul road can make a big difference when it comes to staying within bidding estimates.

That's why you see Allis-Chalmers Motor Scrapers and Motor Wagons on more and more big construction projects like those illustrated here. Cost-conscious, profit-conscious contractors have analyzed them, used them and have satisfied themselves that Allis-Chalmers Motor Scrapers have what they need to help them win bids, stay on schedule and make a profit when they are through with the job.

If you have your sights set on some close-margin, hard-to-get business, we *know* it will pay you to go over *all* the facts with your nearby Allis-Chalmers dealer.

water for use in the plant comes from the Mandan municipal supply. The Standard Oil Co. and the city collaborated on the construction of a raw-water pumping station on the west bank of the Missouri River. Lummus was the contractor for this work, which was done by the city under a separate contract and financed by Standard.

With welded steel pipe used for the water supply, the contractor was able to retain the same equipment and methods used to lay the oil pipeline. The use of cast-iron pipe was held to a minimum throughout the project, being confined to low-pressure, low-temperature, nonflammable service.

Concrete Construction

Footings, foundations, and other concrete structures require approximately 11,000 cubic yards of concrete. The mix is delivered to the site in truck mixers from Deco Ready Mix Co., Mandan. Most of the concrete is bucketed to the forms in shop-made 3 and 5-yard laydown buckets handled by Lima 25-ton cranes.

Wood and metal forms are prefabricated in a well equipped form yard and hauled to place in sections. Universal forms are also being used on the project. Reinforcing steel is prefabricated into cages and mats which are tied and tack-welded into sections for easy transportation and handling by cranes.

For placing concrete, setting structural steel, and hanging pipe on some of the high structures, Lummus used a 200-ton American-Terry derrick operated by a 3-drum American hoist. This big guy derrick had a 210-foot mast and a 190-foot boom, and was equipped with power-operated swing. Other hoisting and erecting operations were handled by six Lima 25-ton crawler cranes.

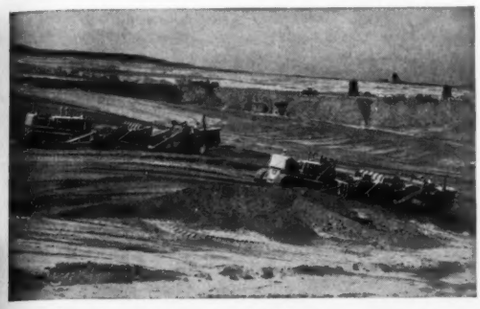
Every piece of equipment on the job, from the smallest hand tool to the largest machine, was painted the same gleaming yellow to identify it as the property of this contractor. This not only prevented the loss of small tools, but also seemed to give the workmen a certain pride in the equipment and a sense of responsibility for its upkeep.

Connecting Pipelines

Pipelines are as important in the operation of this refinery as they were in the selection of the site. A 150-mile 16-inch crude-oil line was laid from the oil fields at Tioga to the refinery at Mandan. From here, a 10-inch products line was laid to Moorhead, Minn., 200 miles to the east, where it connects with Standard's products line from Whiting, Ind. The line to Moorhead was completed last fall, and during the past winter, oil flowed from east to west through the line to supply finished products to the middle North Dakota area. When the refinery goes into operation this fall, finished products will flow through the line from west to east to serve the Minnesota and eastern Dakota markets. Products from the refinery will be trucked and shipped by rail to consumers in other parts of the Dakotas. Finished products from this refinery will be gasoline, kerosene, liquefied petroleum gas, and fuel oils.

Personnel

Project manager for The Lummus Co. is Charles A. Blood. He is assisted by two superintendents, J. H. Baer and Paul Weiss. L. B. Barry is chief engineer, and S. G. Parsons is office manager. Resident engineer for Standard Oil Co. is V. M. Wann. T. E. Stockdale will be plant manager. THE END



Housing Project in California — Here, six big TS-300's and their HD-20 partners team up at the Westlake job near San Francisco . . . for a contractor moving over 8,000,000 yards in the last five years.

Runway Extension in Tennessee — This TS-300 is the first Allis-Chalmers equipment this contractor has ever owned, but it earned a regular spot fast by high-balling capacity loads like this trip after trip.

Dam-Building in Illinois — and the fleet color is Persian Orange. The 176 hp. TS-200's and HD-20's load smoothly, efficiently . . . and the TS-200 is rolling fast toward the fill the instant they break contact.

Railroad Bed in Montana — These TS-300's (14-yd. struck capacity; 18-yd. heaped capacity) averaged 14 trips an hour, excavating grade for a five-track rail bed at the site of a new aluminum plant.

Jet Base in Jersey — Silt and sand make this a tough job . . . but the extra power of the TS-300's, plus the HD-20's ability to exert full power at creep speeds, paid off in big yardage.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Offer Diaphragm Pumps With Varied Mountings

■ Modern automotive-type design is being employed by Rice Pump & Machine Co., Belgium, Wis., to reduce bulk and weight in its new line of diaphragm pumps. These pumps are available in 2, 3, and 4-inch sizes. The units are powered by air-cooled gasoline engines or electric motors. All sizes are available with wheelbarrow, two-wheel, or base mounting.

The wheelbarrow, or one-wheel mounting, makes it possible for one man to handle the pump easily. The handles on these units fold for storage. In the folded position, they can also be used to provide a rear support to the power deck for changing the diaphragm.

Other features include geared speed-reduction cases which are completely enclosed so as to exclude dirt and water. The gears have cut helical teeth, operate in a bath of oil, and turn on ground shafts and needle bearings.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 345.

Pneumatic-Tire Roller Is Self-Propelled Unit

■ A self-propelled pneumatic-tire roller is illustrated in literature from the Tampo Mfg. Co., 1146 W. Laurel St., San Antonio, Texas. The Tampo Model SP9 can operate at forward and reverse speeds of 2.5 and 4.5 mph; travel speeds 6 and 12 mph.

The nine-wheel roller has four front and five rear tires that give 72 inches of solid rolling width. The unit is offered with hydraulic steering and has a towing tongue, electric starter, and a battery and generator. It is arranged for sand or water ballast. Net weight of the empty roller is 6,100 pounds, and maximum gross weight is 18,000 pounds.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 427.

AVOID LEGAL PITFALLS

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Stone Deliveries Delayed; Entitled to Buy Elsewhere

THE PROBLEM: *A rock company agreed to furnish a contractor approximately 31,000 tons for the construction of a jetty. The contractor could require deliveries of 400 tons daily and reserved the right to buy stone elsewhere if deliveries were delayed. Because of the seller's partial failure to deliver, the contractor had to buy 18,000 tons elsewhere. (1) Was the seller entitled to collect the reasonable value of the stone delivered? (2) In adjusting accounts between the parties, was the contractor entitled to credit for expense involved in idling of his equipment due to delayed deliveries of stone? (3) Was the contractor entitled to be reimbursed for the excess of the cost of stone bought elsewhere above the price at which the rock company agreed to deliver?*

THE ANSWERS: (1) Yes. (2) No. (3) Yes. (Galt v. Seaboard Construction Co., 101 Atl. 2d 752, decided by the Pennsylvania Supreme Court.)

(1) The seller, having failed to perform his contract as to 31,000 tons, was not entitled to collect the contract price on the tonnage delivered. But the provision authorizing the contractor to buy stone elsewhere if not delivered on time made the contract separable and entitled the seller to collect the reasonable value of the stone delivered, that value not being disputed by the parties at the trial of the suit.

(2) The contractor's claim expense of idled equipment was denied by the court because the contract provision entitled the contractor to buy stone elsewhere if deliveries were not prompt.

(3) The court thought that the parties did not intend to prevent the contractor holding the rock company liable for the increased cost of getting substitute stone elsewhere when the rock company failed to make prompt delivery. The mere fact that the contractor was authorized to buy elsewhere did not imply that he could not hold the rock company liable for any increased cost of getting substitute stone.

L. J. Dompprope hand-sprays corner of road being oiled.

Operates four Etnyres—2 to 29 years young!

One-man operation . . . nozzles that stay freer . . . and a good pump near the job . . . are three main reasons why "Etnyres are the best we ever had" in the opinion of Marvin F. Borgelt, Treasurer, Bituminous Surface Treating Co. of Minneapolis, Minnesota.

Four Etnyres are in the fleet, ranging in age from two to twenty-nine years. On the unit shown above, no maintenance due to failure of the unit has been necessary. Air controls in the cab make possible one-man operation.

Mr. Borgelt points out that Etnyre has a dependable pump located under the tank, forcing material under constant pressure to the spray bar with an even, nonpulsating flow. Among other features, he points to easy loading, simplified draining, easy-to-start engines, efficient handling of all types of materials, good performance on any type of terrain, plus prompt service when needed from the Etnyre factory organization.

Now is the time for you to investigate Etnyre "Black-Toppers" for better results at lower cost. See your Etnyre dealer or write E. D. Etnyre & Co., Oregon, Illinois, U.S.A.

SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS

Walls Not Sold

THE PROBLEM: *A contractor orally agreed to build two walls at an outdoor theatre. Shortly afterwards, one wall collapsed, and three years later the other collapsed. Under a local statute, suit for breach of a simple contract could not be brought after three years from the date when right to sue arose. Did the right to sue arise when the walls were finished in an unworkmanlike manner, or when they fell?*

THE ANSWER: When they were completed, more than three years before the suit was brought. So, the suit was barred. (Foley Corp. v. Dove, 101 Atl. 2d 841, decided by the Municipal Court of Appeals, District of Columbia.)

The court rejected argument on behalf of the owner that the case was governed by the District of Columbia Sales Act, which, in effect, states that when a thing is sold, there is an implied warranty that it will be reasonably fit for the purpose for which it is intended, thereby making the time limit for suing for breach of the warranty commence to run when the thing fails to meet the warranty. "Construction contracts, where the furnishing of materials is only incidental to the work performed do not come within the Sales Act."

When Bidder Dies

THE PROBLEM: *After a contractor had bid upon a sanitary district job and the bid had been accepted, but before execution of a contract, he died. Were his estate and the surety on his bid bond liable to the district?*

THE ANSWER: No. (Central Contra Costa Sanitary District v. National Surety Corp., 246 Pac. 2d 150, decided by the California District Court of Appeals.)

The court applied the general rule of law applicable to all contracts made by an individual where personal service and integrity are involved, and the contractor dies before entering upon performance.

Bribery Indictment

THE PROBLEM: *An indictment charged that defendant offered a governor one-quarter of one cent for each gallon of liquid highway material of a certain type that should be purchased by the state during a specified year. Did the indictment sufficiently charge bribery?*

THE ANSWER: Yes. (State v. Simon, 99 Atl. 2d 922, decided by the Maine Supreme Judicial Court.)

Wins Race With Time And Death

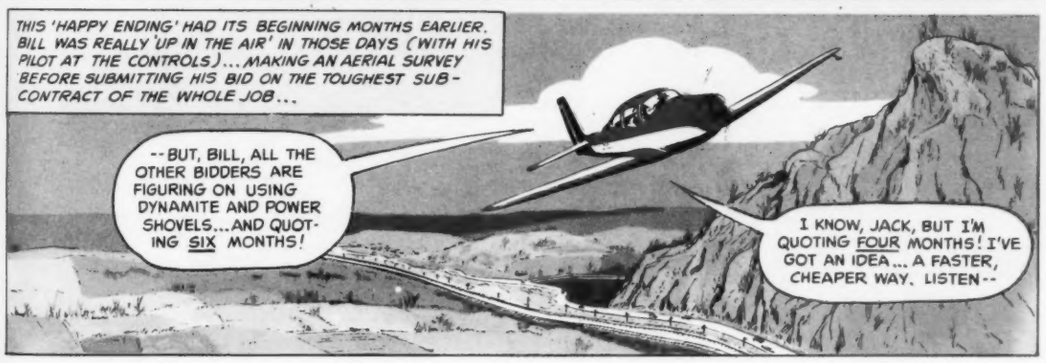
An Actual Job Report from IH

New Highway Ends Traffic Danger at Atomic Plant

PORTSMOUTH, OHIO: — Highway officials here today hailed Bill Ward and his crew of Construction Service, Inc., who completed a difficult sub-contract, part of the relocation of U. S. Highway 23, in one-third the expected time. Ward's fast work speeded completion of the new four-lane expressway replacing an old narrow, twisting road which could not safely carry the increased traffic of the 40,000 new families expected when the new Atomic Energy Plant is completed near here.

Ward's contract covered cutting more than 312,000 cubic yards of earth and rock off steep Four Mile Hill and filling approaches to an overpass a mile away. It was expected to take six months, but today...

WELL, THERE SHE GOES, BILL... THE LAST LOAD OF 'THE JOB THAT COULDN'T BE DONE!' AND TWO MONTHS AHEAD OF SCHEDULE, THANKS TO THAT IDEA OF YOURS!
INTERNATIONAL


THIS 'HAPPY ENDING' HAD ITS BEGINNING MONTHS EARLIER. BILL WAS REALLY 'UP IN THE AIR' IN THOSE DAYS (WITH HIS PILOT AT THE CONTROLS)... MAKING AN AERIAL SURVEY BEFORE SUBMITTING HIS BID ON THE TOUGHEST SUB-CONTRACT OF THE WHOLE JOB...
--BUT, BILL, ALL THE OTHER BIDDERS ARE FIGURING ON USING DYNAMITE AND POWER SHOVELS... AND QUOTING SIX MONTHS!
I KNOW, JACK, BUT I'M QUOTING FOUR MONTHS! I'VE GOT AN IDEA... A FASTER, CHEAPER WAY. LISTEN--

Head in the clouds, feet on the ground

BILL WARD, owner of the Construction Service, Inc., Ludlow, Kentucky, is a man with his head in the clouds... but only when he's making an aerial survey of a prospective job in his four-place Navion plane. The rest of the time his feet are very firmly planted on the ground, when it comes to getting things done in the contracting business.

Starting as a shovel runner in New England for B. Perini & Sons, Inc., Framingham, Mass., Bill worked up to superintendent. In 1945 he realized an 18 year ambition by going into business for himself with a single power shovel. On the Four Mile Hill subcontract he used 20 big pieces of earth-moving equipment, including six INTERNATIONAL crawlers with matched INTERNATIONAL dozers, two INTERNATIONAL B-170 scrapers, and three INTERNATIONAL two-wheeled, rubber-tired tractors and scrapers.

He's proudest of the fact that he won the 1952 Safety Award given by the West Virginia chapter of the A.G.C. Association in the 10-20,000 man hours per year class for not having a single lost time accident. In 1953 he again finished out the year with a similar safety record. That's a real tribute to Ward, his men, and his big red INTERNATIONAL Power!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL

POWER THAT PAYS

Now All in One Family

The hardest-working work teams in the world!

TD-24 crawler with matched scrapers

TD-18A crawler with matched scrapers

TD-24 crawler with bullgrader

T-9 and TD-9 crawler with hydraulic bulldozer

T-6 and TD-6 crawler with hydraulic bulldozer

TD-14A crawler with cable bullgrader

TD-9 tractor with front-end loader

TD-18A crawler with sideboom

Model 2T-75 two-wheel, rubber-tired tractor with 18 heaped-yard capacity scraper

Model 2T-75 two-wheel, rubber-tired tractor with 20 heaped-yard capacity bottom dump wagon

Model 2T-55 two-wheel, rubber-tired tractor with 13 heaped-yard capacity scraper

CR-610-D 2/28

LITHOGRAPHED IN UNITED STATES OF AMERICA

Contractor Terminates Tunnel Subcontract

THE PROBLEM: *Where a prime contractor wrongfully terminated a subcontract for tunnel construction, and the subcontractor sued for damages, did the trial judge properly permit one of the subcontractors to estimate the cost of completing the job, he having had considerable experience in underground work, although he was not an engineer?*

THE ANSWER: Yes. (Kelly v. Valley Construction Co., 262 Pac. 2d 970, decided by the Washington Supreme Court.)

The court said that a trial judge has considerable discretion in determining whether or not a witness is sufficiently qualified to give an opinion as an expert.

It was also decided that there was a proper basis for measuring the damages to which the subcontractors were entitled, these factors being established: there was a definite work period of 200 days; the distance to be tunneled was fixed at 4,820 feet; the maximum cost was $33 per linear foot; and labor costs were proved, as was the number of headings needed to complete the tunnel. Thus the court found that this was not one of those cases where it is difficult at times to draw a line between speculation and conjecture on one hand, and a reasonable method of estimation on the other.

Materialman's Right To Collect on Bond

THE PROBLEM: *Under a Nebraska statute relating to public construction contracts, a prime contractor gave bond to pay for materials "actually used" on the job. The contractor ordered creosote piling from plaintiffs, materialmen. Pending arrival of the piling, the contractor used a supply furnished by another materialman and, on arrival of plaintiffs' piling, used part of it to repay the other materialman. (1) Did the bond cover that part of the piling? (2) If plaintiffs, as materialmen, agree with the contractor to extend the time for paying for materials until completion of the job (assuming that the job would be completed in due course), did that release the contractor's surety's liability as to such materials?*

THE ANSWERS: (1) Yes. (2) No. (Higgins & Coufal v. Massachusetts Bonding & Insurance Co., 112 Fed. Supp. 390, decided by the United States District Court for Nebraska, Omaha Division.)

The decision on the second point rested upon the facts that the extension of time for paying for the materials did not exceed the time fixed by the bond in which suit could be brought upon it, and that the extension did not harm the surety.

Roadside-Planting Contract

THE PROBLEM: *A roadside-improvement contract provided for payment on a cubic-yard basis for 6 inches of topsoil on seeded areas. Planted roots were to be set in 10 inches of topsoil, and it was agreed that plants and planting should be paid for at unit prices. Was the contractor entitled to payment at the yardage rate for 10 inches of topsoil in the planted areas?*

THE ANSWER: No. (Gull Contracting Co., Inc., v. State, 126 N. Y. Supp. 2d 415, decided by the New York Supreme Court, Appellate Division, Third Department.)

Telephone Service Is Bad: Company Liable

THE PROBLEM: *A contractor having his office at home, applied for single-party business telephone service. He got no phone for more than two years, and then only on a ten-party line. Eighteen months later he got single-party service. Was he entitled to damages against the telephone company?*

THE ANSWER: Yes. (Mountain States Telegraph & Telephone Co. v. Hinchecliffe, 204 Fed. 2d 381, decided by the United States Court of Appeals, Tenth Circuit.)

But the court stressed the point that, although it is not necessary that the precise amount of dollar damage suffered be proved, damages cannot be allowed on a guess-work basis.

An award of $1,000 damages was declared to be amply supported by proof that an employee of the contractor had been compelled to drive a certain total distance to obtain instructions because he could not get them by phone. Fluctuation in the volume of the contractor's business during the periods when adequate telephone service was and was not available was considered.

There Was No Partnership

THE PROBLEM: *Construction contracts were taken in defendant's name. He hired and fired employees and directed them, although defendant was associated on the jobs. Defendant handled all money affairs. Plaintiff was paid a monthly salary and reported it as income from defendant. No partnership return was filed. Plaintiff signed an agreement relating to the work as defendant's agent. In income tax and social security accounting, plaintiff was treated as defendant's employee. Did these facts disprove plaintiff's right to an accounting of profits on a theory that a partnership existed, even though title to equipment which plaintiff bought for use in the business was taken, without defendant's knowledge or consent, in the names of both?*

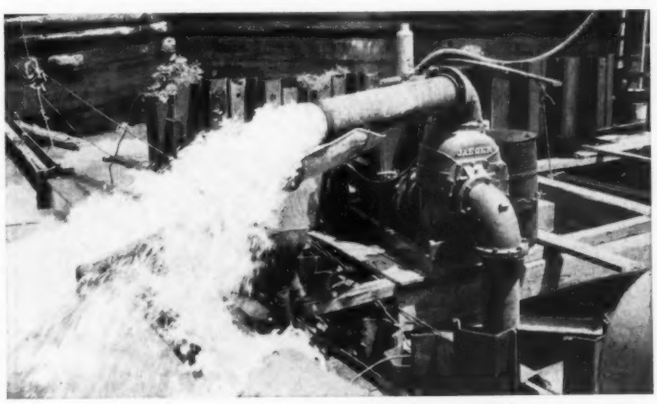
THE ANSWER: Yes. (Thomas v. King, 99 Atl. 2d 778, decided by the Delaware Supreme Court.)

(Concluded on next page)

Hi-performance Jaeger pumps cut water-handling costs

New Model 2PN moves all the water a 2" hose can handle

This latest Jaeger 2" pump delivers its rated 10,000 gph when operating at only 2400 to 2550 rpm (as much as 400 rpm slower than similar pumps). It will actually pump all the water that can be pulled through a 2" suction line under average pumping conditions. You'll find it conservatively rated, even at heads well above 100 ft. Weighs only 190 lbs. including big pneumatic tires, measures only 24" x 21" x 26" high, yet it's built for heavy duty service with 20% steel shell, reversible liner plate, long-life Jaeger Lubri-Seal on shaft, impeller adjustable for wear and powerful Wisconsin AKN engine of 5.3 hp at 2500 rpm.

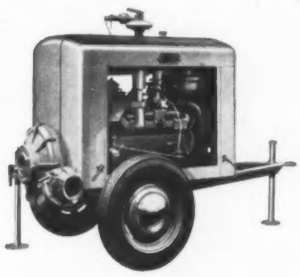


Pumping 4,000 gpm with low-cost diesel power

Because they develop their full rated volume at low operating speeds, big Jaeger pumps are ideally suited for diesel operation on big cofferdam and well point work. The Jaeger Model 10PD above is pumping 4000 gpm at 1500 rpm. This high efficiency at fuel-saving, engine-saving speeds is an exclusive characteristic of Jaeger "Sure-Prime" pumps. It requires larger shells and impellers but pays off in performance. Jaegers prime without engine-racing, don't vapor-lock on hard pulls, consume less fuel and average thousands of hours longer service than pumps that must run at higher speeds.

Latest type jetting pumps in 3", 4", 5", 6" sizes

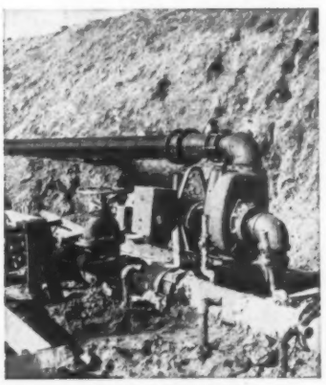
For a wide range of volumes, and pressures up to 275 psi, Jaeger has developed the most modern type of high pressure pumps . . . self-priming at the rate of 1 second per foot of lift, equipped with enclosed impellers, labyrinth sealing rings, positively lubricated shaft seals, automatic spring-actuated check valves, heat-resisting stellite-valved engines:



Model 3CPH delivers 420 gpm at 40 lbs., 125 gpm at 130 lbs., with air-cooled Wisconsin VF-4 (25 hp @ 2400 rpm).

Model 4CPH delivers 700 gpm at 75 lbs., 325 gpm at 200 lbs., with 6 cylinder engine of 218 cu. in. displacement (80 hp @ 2500 rpm).

Model 5CPH delivers 825 gpm at 80 lbs., 200 gpm at 250 lbs., with 6 cylinder engine of 236 cu. in. displacement. (95 hp @ 2600 rpm).



1½" to 10" Electric Pumps

Jaeger "Sure Prime" pumps with electric motor drive are available for all types of dewatering, including the operation of Jaeger Well Point Systems. The characteristic low speed (1150 rpm) operation of Jaeger 6" to 10" electric pumps results in much longer life. Jaeger's oversize shells, holding more priming water, also prevent overheating and vapor-lock even when exhausting the longest well point header lines.

For engineering service on pumping problems, or specific information about any Jaeger pumps, see your Jaeger distributor or write. For file data, request Catalog P-4.

THE JAEGER MACHINE COMPANY

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TRACTOR LOADERS • COMPRESSORS • CONCRETE MIXERS • PAVING MACHINES

(Continued from preceding page)

This case, which involved considerable expensive litigation, illustrates the importance of written agreements clearly fixing the status of assistants in contracting ventures, where there is the slightest likelihood of the assistant later asserting rights as a partner.

Blasting Damage

THE PROBLEM: *In blasting a ditch, a highway contractor caused rock formation under adjacent land to crack, ruining the owner's wells. In the absence of proof that the water supply could be restored at less expense, was the owner entitled to hold the contractor liable for the difference in the value of the land—a 240-acre farm—with and without the water supply that the wells afforded?*

THE ANSWER: Yes. (H. D. Youngman Contractor, Inc., v. Girdner, 262 Pac. 2d 693, decided by the Oklahoma Supreme Court.)

Security Taxes

THE PROBLEM: *A state highway contract required the prime contractor to pay all labor and material bills and permitted the state to retain a percentage of sums due the contractor. The obligation to pay the bills was secured by bond. Could the state, as against the surety, deduct from the withheld funds enough to cover what the contractor owed the state for employment security taxes?*

THE ANSWER: No. (Duteau v. Salvucci, 115 N. E. 2d 726, decided by the Massachusetts Supreme Judicial Court.)

The court said that applicable statutes manifested intent that there should be security for the payment of labor and material bills, and that until such bills were satisfied, no outside claims could reach the proceeds of the contract. The surety's obligation to pay claims was limited to labor and material bills, and the state was a sort of trustee of the funds for the benefit of labor and material claims and the surety.

The court referred to its previous decision (J. H. McNamara, Inc., v. McGuire, 254 Mass. 589, 150 N. E. 862) to the effect that rights of laborers and materialmen were superior to the right of a contracting city to apply retained contract proceeds in reduction of a damage claim against general contractors who abandoned the contract.

Careless Pedestrian

THE PROBLEM: *A sewer contractor, in ditching, cast dirt on a lawn and rain converted it into mud. The plaintiff knew that and was injured when, while walking in darkness across the lawn, she slipped on the mud. Was the contractor liable in damages?*

THE ANSWER: No. (Morrison & Conklin Construction Co. v. Cooper, 256 S. W. 2d 505. Kentucky Court of Appeals.)

Even if plaintiff had no safe choice of access across the lawn, she was bound to use a flashlight or other means to secure her own safety. She could not make the contractor an insurer of her safety merely because she may have had to walk across the muddy area.

Reclaiming Equipment That Has Been Lent

THE PROBLEM: *Even if the lessee of a bulldozer was delinquent in the payment of rent, would the lessor be liable to him for damages resulting from retaking possession of the bulldozer without legal proceedings and without the lessee's consent?*

THE ANSWER: Yes. (Grant v. Emmons, 69 So. 2d 157, decided by the Louisiana Court of Appeal, New Orleans.)

But the court decided that the lessor was not liable because, in fact, the lessee had authorized him to retake possession.

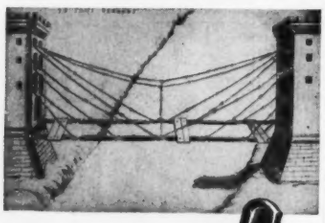
An Assignment Amounted To a Chattel Mortgage

THE PROBLEM: *A subcontractor's application for a surety bond assigned to the surety the subcontractor's interest in materials and equipment brought upon the site, as security to indemnify the surety on its becoming liable for the subcontractor's default under the subcontract. Was the assignment, in legal effect, a chattel mortgage under Indiana law? (If so, it gave the surety a lien that was inferior to the lien of the federal government against the materials and equipment on account of delinquent taxes, because, first, the assignment had not been recorded; and second, because it was not recordable since the subcontractor's signature had not been acknowledged before a notary public or other officer, as required by Indiana law.)*

THE ANSWER: Yes. (Western Casualty & Surety Co. v. United States, 109 Fed. Supp. 422, decided by the United States Court of Claims.)

It was an important factor in the case that the government had no actual knowledge that the subcontractor had assigned his interest in the material and equipment to the surety. Otherwise, the court intimated that the government's claim would have been inferior to the surety's claim because failure to record a document in a public office—such as in the office of a county register or recorder of deeds—does not lose priority or legal right under the document as against a third party who has actual knowledge of those rights.

Verantius' Pons Ferreus
A SUSPENSION BRIDGE DESIGN
early seventeenth century



Engineering problems have been growing more and more complex in the past 300 years, and with them has grown the need for greater drafting precision. Since 1662, when the first Staedtler pencils were produced in Nurnberg, Germany, Staedtler has made constant improvements in pencil design and manufacture. Today, the Mars-Lumograph is America's finest imported drawing pencil; in the clutch pencil field the combination of the new 1001 Mars Technico push-button lead holder and 1904 Mars-Lumograph imported drawing leads insures your having the very best.

The 2886 Mars-Lumograph drawing pencil gives you precise thickness and the blackness of line needed for crisper, cleaner prints. Perfectly graded in 19 degrees; EXEXB to 9H. $1.50 per dozen—less in quantity.

The 1001 Technico Mars-Lumograph push-button lead holder costs no more than ordinary holders, has a noiseless, smooth-working, low-friction clutch mechanism, lightweight wood construction with perfect balance and, built into the push-button cap, a unique lead sharpener. $1.50 each—less in quantity.

1904 Mars-Lumograph Imported Drawing Leads are so opaque that inking-in is not necessary. Leads are ribbed for firm clutch grip and each has a removable cap which prevents sliding from holder. Available in 18 degrees; EXB to 9H. $1.20 per dozen—less in quantity.

J.S. STAEDTLER, INC.
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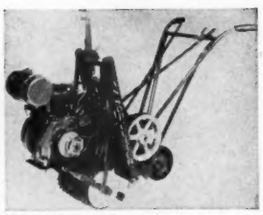
Ryan POWER SOD-CUTTER
Quality Built

5000 sq. yds. of SOD
● **per MAN!**
● **per DAY!**
EVERY INCH
● **clean-cut!**
● **uniform!**



The Ryan is a one-man sensation! 5,000 square yards of sod per day—and every inch is clean-cut and uniform in thickness. The cutting blade is of tempered spring steel. Automatic shock release permits blade to "give" when meeting stones or other hard objects. Thickness-of-cut is easily regulated—adjusts from ½ to 2½ inches. The RYAN is powered with either Wisconsin or Briggs-Stratton engine. Available in 12-inch, 15-inch or 18-inch widths.

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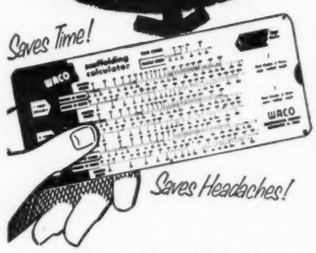

tells you the scaffolding you need for every job.

Tells you in seconds the number of frames and cross braces you need for most jobs. Saves you hours of "desk work." Helps you figure each job closer. Get yours now. FREE! Write today!

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RENTAL SERVICE—Stock the units you need *most* of the time . . . rent special equipment as needed from your Waco Distributor.

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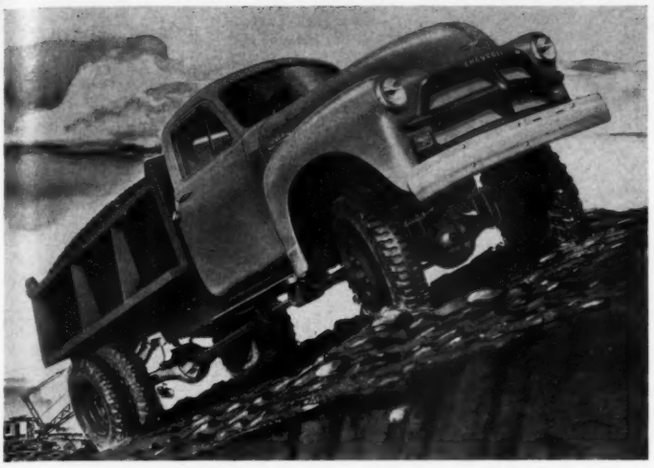
Licensees: Waco-May Co., Los Angeles, Calif. Armson Iron Works, Windsor, Ontario
A few good Waco Distributorships available. Write.



The Napco Powr-Pak four-wheel drive may be installed on Chevrolet trucks to provide greater traction over rough terrain.

Four-Wheel-Drive Unit Available for Trucks

■ A four-wheel drive for Chevrolet trucks, featuring a two-speed range and fingertip control, is offered by Napco Products Division, Northwestern Auto Parts Co., 834 N. 7th St., Minneapolis, Minn. The Napco Powr-Pak four-wheel drive gives the trucks extra traction for traveling over rough terrain, ice, snow, mud, and sand. Dealers can provide new Chevrolet trucks that are already equipped with the Napco Powr-Pak, and it is also possible to convert trucks presently in use.

It is stressed that the normal easy turning and handling characteristics of Chevrolet trucks are not affected by installation of the four-wheel-drive unit and that no whip or weave at high-speed operation will result. Installation of the Powr-Pak drive requires the use of only standard Chevrolet truck parts so that no special maintenance stock of parts is required.

For further information write to the company, or use the Request Card at page 18. Circle No. 357.

New Premium Gasoline Minimizes Knocking

■ A premium gasoline reportedly so far advanced in octane that it silences knocking in all but a few cases is announced by the Standard Oil Co. (Indiana), 910 S. Michigan Ave., Chicago 80, Ill. The White Crown gasoline also contains the de-icer additive, introduced by this company last fall, which prevents ice from forming on the carburetor throttle plate.

It is stressed that the gasoline retains its previously announced qualities such as high volatility and seasonal balance. Octane numbers were not announced.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 359.

Wisconsin Motor Appoints

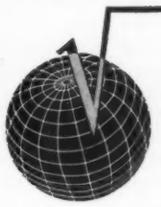
Ray J. Fellows, assistant sales manager for Wisconsin Motor Corp., Milwaukee, Wis., has been appointed sales manager for the organization. J. W. Perschbacher, a territorial representative since 1947, succeeds Mr. Fellows as assistant sales manager.

Portable Chain Saw

■ A one-man chain saw of 5.5 brake horsepower and weighing 30 pounds complete is shown in literature from the Homelite Corp., 54 Riverdale Ave., Port Chester, N. Y. The Homelite Model 5-30 chain saw cuts in any position on any type of work including notching, felling, bucking, boring, limbing, and undercutting. It is available with 18 to 60-inch straight blades or 14 and 18-inch plunge cut bows.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 463.

What Is Your Subsurface Problem?



Geo-Research — established as a division of the Syracuse University Research Institute — obtains rapid, time-saving subsurface information that is dependable . . . Professionally staffed, our modern, refraction seismographic services, together with the most effective coring and sampling methods, can solve difficult, below-surface problems — anywhere.

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Mixer Blade Life Increased 19 Times *by* ***Hard-Facing***

Blades hard-faced with HAYSTELLITE tungsten carbide rod have been in operation for 20 months—and are still in good condition. They have mixed 36,000 cubic yards of concrete while operating 3 shifts a day, 6 days a week. Unprotected cast steel blades had to be replaced every 4 to 5 weeks while operating under the same conditions. More than 19 shutdowns have been eliminated by hard-facing, and repair and replacement costs have been cut sharply.

Big savings like this are not unusual when HAYNES hard-facing products are used to prolong the life of equipment. These wear-resistant materials give outstanding service when used to protect conveyor screws, buckets, crushers, tractors, and other equipment exposed to abrasion, corrosion, impact, or heat.

Your local dealer carries a complete line of HAYNES hard-facing alloys, including HAYNES iron and nickel-base rods, HAYNES STELLITE cobalt base rods, and HAYSTELLITE tungsten carbide tube rod. Ask him for descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

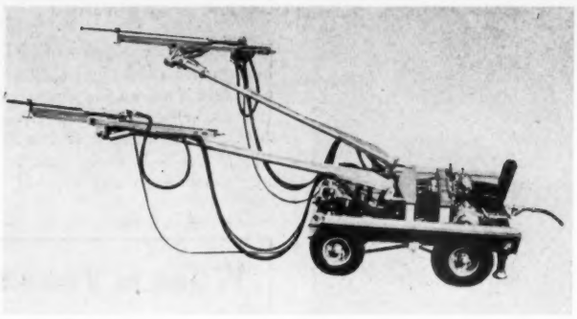
See... Your local Haynes Stellite Dealer

or

Write... to Haynes Stellite Company

"Haynes," "Haynes Stellite," and "Haystellite" are registered trade-marks of Union Carbide and Carbon Corporation.

Self-Propelled Jumbo Positions Drills From Operator's Seat



The new Gardner-Denver JSP Mobiljumbo is a self-propelled unit that enables the operator to perform all rock drilling operations by remote control.

■ A new self-propelled Gardner-Denver drill jumbo has remote drilling controls so that one operator can move into position and drill out a complete round in drift, tunnel, room, quarry, or rock cut without leaving his seat on the jumbo carriage. The positioning of the booms and drills, as well as the complete cycle, is handled by hydraulic controls grouped in front of the operator.

One lever on each side of the control panel raises or lowers the JSP Mobiljumbo on jacks for stability while drilling. Another set of levers raises or lowers each boom independently, while other levers swing the booms laterally. Drills are positioned by hydraulic cylinders near the end of each boom, and these cylinders are also operated by levers at the control panel to move the drills through vertical and horizontal arcs. The drills can be positioned for down, up, and horizontal holes. This feature makes it possible to equip the machine for drilling roof bolt holes. All positioning is hydraulically locked and free from creeping.

The complete cycle for each drill—including drill speed, feed pressure, hole cleaning, and steel withdrawal—is also remotely controlled from the operator's seat. Each set of side wheels is chain driven by an air motor, and the carriage can be steered by powering one set of wheels at a time. Where underground lighting is needed, the new drilling unit can be equipped with an air-motor-driven generator. Various boom lengths are available for efficient drilling of faces up to 14 feet high. Face widths of 25 feet can be drilled off from a single setting of the machine.

For further information write to the Gardner-Denver Co., S. Front St., Quincy, Ill., or use the Request Card at page 18. Circle No. 386.

NEED LOW-COST "Mobile" STEAM on the spot?

This Cleaver-Brooks boiler *on wheels* delivers dry steam in 30 minutes or less after arrival

CONTRACTORS who need steam on-the-spot and *in a hurry* depend on Cleaver-Brooks mobile boilers. They know they get plenty of steam the *easy way*. These self-contained boilers can be towed by truck or tractor at a 35-mile clip, job-to-job or moved anywhere on job site. On arrival, one man can hook up water and steam lines . . . start oil burner, and in 30 minutes or less, you're all set with a good "head of steam."

Fully self-contained, with oil and fuel tanks built in, these Cleaver-Brooks mobile boilers require minimum maintenance. They're all-weather protected. No need to bank fires at night for an early start in the morning. Forced draft, four-pass fire tube design, high efficiency oil burner plus completely integrated automatic controls, assure guaranteed 80% efficiency. You get fast steam response for fluctuating demands from full loads down to 30% of rating.

You can use this handy all-year, all-weather boiler for contract or subcontract jobs. Work like this will keep you busy: Pile driving, extracting, winter concrete thawing, asphalt plant bitumin heating, ready-mix concrete operations, and many other profitable jobs. Available in two sizes — 80 and 125 hp. — trailer or skid mounted for installation on truck or trailer.

See your nearest Cleaver-Brooks Distributor, or write direct for details. Cleaver-Brooks Company, Dept. F, 396 E. Keefe Ave., Milwaukee 12, Wis.

Cleaver-Brooks

Pioneers and Originators of Tank-Car Heaters • Bituminous Boosters "Deuce" • "Peak-Temp"

Ask for bulletin RM-108 which fully describes Cleaver-Brooks Mobile Boilers.

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ALABAMA—J. D. Pittman Tractor Co., 500 N. 28th St., Birmingham 2; Burford-Toothaker Tractor Co., 2521 Halls Mill Rd., Mobile; P. O. Box 1591, Montgomery 2.
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ILLINOIS—Hillman Equipment Co., Box 170, Bloomington; 2000 N. Hawthorne, Melrose Park; Wisner, Inc., 821 Main St., Peoria; 1319 Broadway, Rockford. 526 - 11th St., Rock Island.
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MISSOURI—The Victor L. Phillips Co., 16th and Baltimore Sts., Kansas City; The George F. Smith Co., 5215 Manchester Ave., St. Louis.
MONTANA—Hall-Perry Machinery Co., 304 Fratt Bldg., Billings; 802-812 E. Iron St., Butte; Coram; P. O. Box 307, Great Falls; Missoula.
NEBRASKA—Anderson Equipment Co., 200 Merchants Nat'l Bank Bldg., Omaha 2.
NEW HAMPSHIRE—Parker-Danner Co., 507 Elm St., Manchester.
NEW JERSEY—R. E. Brooks Co., Route 17, Box 17, Hasbrouck Heights.
NEW MEXICO—R. L. Harrison Co., Inc., 1801 N. Fourth St., Albuquerque.
NEW YORK—Syracuse Supply Co., 76 Wall St., Binghamton; 2080 Military Rd., Buffalo 17; R. E. Brooks Co., 50 Church St., New York; Syracuse Supply Co., Portville Road, Olean; Van's Equipment Sales, Inc., Routes 9 and 20, Rensselaer; 1349 University Ave., Rochester; Syracuse Supply Co., 294 Ainsley Drive, Syracuse.
NORTH CAROLINA—North Carolina Equipment Co., P. O. Box 5006, Asheville; P. O. Box 1205, Charlotte; P. O. Box 128, Guilford; P. O. Box 655, Wilmington; 3101 Hillsboro St., Raleigh.
NORTH DAKOTA—Northwestern Equipment, Inc., 715 11th St., Bismarck; 901 Eighth St., Devils Lake; P. O. Box 110, Dickinson; P. O. Box 152, Fargo; P. O. Box 335, Minot; P. O. Box 628, Wahpeton.
NEVADA—Sierra Machinery Co., 307 Morrill Ave., Reno.
OHIO—The W. W. Williams Co., 914 Main St., Cincinnati; 18301 Brookpark Rd., Cleveland 11; 835 W. Goodale Blvd., Columbus; 1260 Conant St., Maumee.
OKLAHOMA—The Victor L. Phillips Co., 1101 E. Archer, Tulsa; 1222-24 W. Main St., Oklahoma City.
OREGON—Howard-Cooper Corp., Highway 99E, P. O. Box 443, Albany; Highway 99, P. O. Box 86, Central Point; P. O. Box 1, Coquille; First and Van Buren, Eugene; 5821 N. E. Gilsan St., Portland 13; 225 E. 2nd Ave., S., Roseburg.
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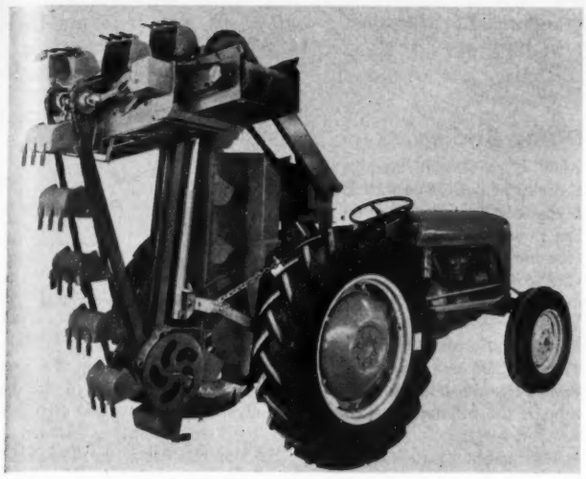
SOUTH DAKOTA—Sioux Road Equipment Co., 500 E. Sixth St., Sioux Falls; Box 941, Rapid City.
TENNESSEE—Wilson-Wessner-Wilkinson Co., 202 W. Morelia Ave., Knoxville; Tri-State Equipment Co., 124 E. Calhoun Ave., Memphis; Wilson-Wessner-Wilkinson Co., 310 S. 2nd St., Nashville.
TEXAS—Alamo Iron Works, Brownsville; Corpus Christi; Tri-State Equipment Co., 500 E. Overland St., El Paso; Conley-Lott-Nichols Machinery Co., 1311-19 S. Ervay St., Dallas 1; Conley-Lott-Nichols Company, 3601 Avenue H, Lubbock; Tri-State Equipment Co., P. O. Box 472, Odessa; Alamo Iron Works, Santa Clara & Montana Sts., San Antonio 6.
UTAH—Kimball Equipment Co., 222 W. 17th St., S., Salt Lake City 10.
VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 39th St. and Killam Ave., Norfolk; Natural Asphalt Corp. of Virginia, 1901 Hamilton St., Richmond.
WASHINGTON—Glenn Carrington & Co., 91 Columbia St., Seattle 4; Howard-Cooper Corp., 5045-55 - 4th Ave., S., Seattle 8; Intermountain Equipment Co., 611 E. Sprague, Spokane.
WEST VIRGINIA—West Virginia Tractor & Eq. Co., P. O. Box 473, Charleston; P. O. Box 587, Clarksburg.
WISCONSIN—The Stone Manufacturing Co., 321 N. 25th St., Milwaukee 3; Badger Equipment Sales, Inc., Route 2, Thiensville.
WYOMING—Studer Tractor & Equipment Co., East Yellowstone Highway, Casper.
ALASKA—Glenn Carrington & Co., c/o Westward Hotel, Anchorage.
CANADA—Mussens Canada Ltd., Church St., New Brunswick, Fredericton; Coleman Machinery Co., Ltd., 101 Upper Water St., Nova Scotia, Halifax; Mussens Canada, Ltd., 65 Colborne St., Montreal 3; Ontario Equipment & Supply, Ltd., 111 Merton St., Toronto, Ontario; Frost Machinery Co., Ltd. 971 Erin St. Winnepeg, Manitoba; International Agencies & Machinery Co., 2315 Cambie St., Vancouver, B. C.; Mussens Canada, Ltd., Charest Blvd., Quebec.



The newest Everett trencher for Ford and Ferguson tractors.

Bucket-Type Trencher Is Tractor-Mounted

■ A new tractor-mounted bucket-type trencher for Ford and Ferguson tractors is announced by the Earth Equipment Corp., 2036 Sacramento St., Los Angeles 21, Calif. The Everett Trencher cuts up to 42 inches deep in a width of 12 to 18 inches. It is recommended for drainage and irrigation ditching and foundation work, as well as for water, gas, oil, and power-line trenching.

Improvements include a new built-in rock guard, single-wheel design said to give faster penetration, a new V-belt power drive, and easily accessible controls. Operating from the power takeoff of the tractor, the trencher is raised and lowered by a built-in hydraulic system. A V-belt safety-slip feature is built into the drive of the unit to stop the bucket line when obstacles such as pipelines, heavy roots, large rocks, and foundations are encountered.

For further information write to the company, or use the Request Card at page 18. Circle No. 397.

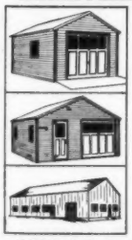
Bulletin on Battery Unit For Stud-Welding Use

■ A newly designed battery unit which supplies power for welding studs up to ½-inch-base diameter is described in a specification sheet from KSM Products, Inc., 322 Woodland Ave., Merchantville, N. J.

The new KSM literature provides complete details on the unit's tap-selector switch, output terminals, and twelve heavy-duty batteries which are kept charged by an automatic charger.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 454.

Cooper-Built



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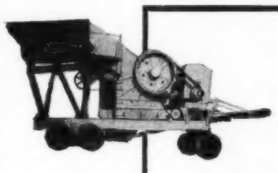


To the scores of satisfied users of Diamond products, and to future Diamond customers, it is a pleasure to announce that the Diamond Iron Works line of crushing, screening, washing, and conveying equipment for rock, gravel, aglime, and corporate aggregates has been acquired by Goodman Manufacturing Company, Chicago.

Goodman, 54 years a leading designer and manufacturer of heavy equipment for underground mining and tunnelling, will contribute advantages inherent in a large organization of sound reputation and technical skill.

Manufacturing, as well as Diamond's sales and engineering departments, have been transferred from Minneapolis to the Goodman plant in Chicago. Now that larger and better facilities are available, Diamond users can expect such benefits as improved service—better-than-ever Diamond products.

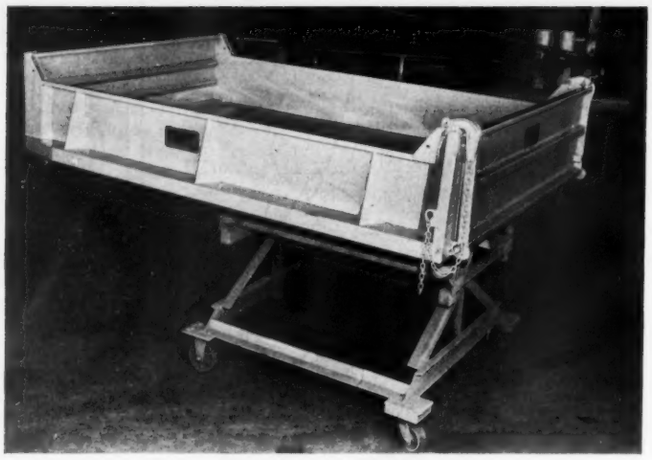
Experienced engineering and sales counsel will be maintained by Diamond veterans. An established Diamond distributor—there are more than fifty located throughout the country—will continue to serve you. Your call upon any of our services will be promptly cared for.

DIAMOND

DIAMOND IRON WORKS

division GOODMAN MANUFACTURING COMPANY

Halsted Street and 48th Place • Chicago 9, Illinois



This heavy-duty steel dump-truck body is now made by the Hobbs Mfg. Co. of Fort Worth, Texas.

Steel Dump Bodies

■ Production of a line of heavy-duty steel dump bodies is announced by the Hobbs Mfg. Co., Fort Worth, Texas. The new Hobbs dump body, designed for hard service, has a capacity of 1½ to 4 cubic yards.

The shell of the unit is of 10-gage sheet steel and is welded to the understructure to form virtually a one-piece body. The cross members extend beyond the sides of the body shell to support the full-length running boards and vertical V-type side braces. The tailgate is double-acting, with controls concealed and protected by the running boards. Offset upper hinges allow quick opening of the tailgate to its maximum capacity, making for rapid unloading.

For further information write to the company, or use the Request Card at page 18. Circle No. 346.

Trailing Third Axle Gives Cab-Controlled Weight Redistribution

■ The principal advantage of a new trailing third axle offered is the wide choice of axle-weight distribution it gives operators, according to the manufacturer, the Truckstell Mfg. Co., 1437 Union Commerce Bldg., Cleveland 15, Ohio.

Operating on a simple hydraulic principal, Hydro-Trac provides selective control over axle-weight distribution in ratios ranging from 50-50 for normal conditions, to 80-20 for maximum traction, and to 100-0 for return trips empty.

From a control in the cab, truck operators can choose the weight ratio needed to meet road conditions while the truck is rolling or standing still. For return trips when the truck is empty, the trailing axle can quickly be lifted clear of the road to provide single-axle operating economy.

It is pointed out that the new unit makes possible the payload advantages of trailing axle six-wheelers, cab-controlled traction practically equal to that of dual-drive, plus single-axle economy when the truck is empty. It comes factory-assembled, complete with the trailing axle matching the driving axle on the original truck. The unit works equally well on trucks with various body types and tractors with semi-trailers and is said to be easy to transfer from one truck to another. The heart of the Hydro-Trac design is the Willock weight-transfer system operated by a hand pump or high-speed electrically driven pump, either of which can be furnished. A hydraulic cylinder, supported at the rear by a reinforced cross member, transfers the load weight from the trailing axle to the driving axle by applying torque through a trunnion cam.

For further information write to Card that is bound in at page 18. Circle No. 408.

Diesel Engine Bulletins

■ A new series of bulletins covering the full line of P&H diesel engines is announced by Harnischfeger Corp., Diesel Division, 505 S. Main, Crystal Lake, Ill. The 8½ x 11-inch sheets, which are handy for filing and reference purposes, give condensed information and specifications on this line of 2-cycle diesel engines. There is a separate bulletin for each diesel with pictures of each model or engine and power unit. Marine diesel engines are covered separately. All models, rated at 20 to 138 hp and with 2, 3, 4, and 6 cylinders are included in the new series of specification bulletins.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 464.

CMC JOB MIXERS WILL POUR CONCRETE FASTER— SAVE MEN AND MONEY

They are built to take it . . . Compact.. Easy to Spot.. Easy to move

3½S NON-TILT

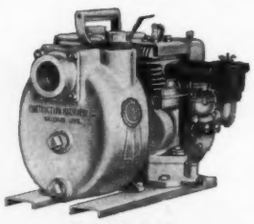
3½S TILTER

CMC Job Mixers are the biggest money makers in the mixer field. They are the easiest handled on the job and are perfectly balanced for high speed trailing.

If you want the best with the longest trouble-free performance choose CMC Job Mixers.

3½ to 16 cubic foot models are available to fit any job condition.

CMC DUAL PRIME PUMPS ARE LIGHTER WEIGHT YET LONGER LIVED

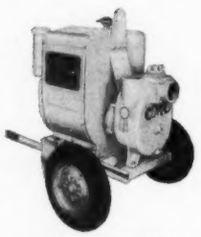


4M — 4000 G.P.H.

New dual volute design makes priming rapid, automatic and dependable. Unipacked shaft seal is protected by rapidly spinning liquid screen. Fewer parts — easier to service.

ALL SIZES

Built in all pipe sizes 1½" through 4". Other CMC Dual Primers in 6", 8" and 10" sizes with capacities to 240,000 G.P.H. Larger pumps have water cooled engines — gasoline or diesel. Also full line of electric pumps and pumps for belt drive.



40M — 40,000 G.P.H.

SOLD & SERVICED BY AMERICA'S BEST DISTRIBUTORS

CONSTRUCTION MACHINERY COMPANIES . . . . . WATERLOO, IOWA

NO RAMMING OR JAMMING! NO SPINNING OF WHEELS WHEN LOADING BULKY OR "PACKED" MATERIALS

LESSMANN LOADALL

DIGS IN WHILE STANDING STILL!

Check these features!

- **STANDARDIZED PARTS.** Ford, Timken, Vickers, Bendix, etc., assure highest quality components and low-cost servicing.
- **SAFETY.** Operator has unrestricted visibility and is protected from loader arms.
- **EASY HANDLING.** Full reverse shifting gives LOAdALL four speeds forward and four reverse. Three simple, conveniently located hydraulic controls assure efficiency.
- **LOW COST.** You save on first cost, operating costs and maintenance costs with a LOAdALL.
- **LOAdALL BUCKETS.** Available with capacities of ⅜, ¾, ⅞, 1, 1¼ and 1½ yards.

A HIGHLY MANEUVERABLE POWER SHOVEL

Lessmann LOAdALL scoops up big loads of the most heavily compacted soils, cinders, aggregate, etc. . . . does it in 5 seconds while standing still! Extra hydraulic cylinders supply Hydraulic Power Crowd. This means *loading* with hydraulics which eliminates ramming and spinning of wheels . . . *minimizes repairs, reduces maintenance!* Dozer blade is easily attached for grading, backfilling. Crane-hook, lift forks, snow and trash buckets are also available.

9 FT. DUMPING CLEARANCE

LOAdALL has clearance for the highest trucks, bins and mixing hoppers. It loads or unloads at any height from 12" below wheel level to 108" above. Wheelbase of 73" and 12' turning radius make it highly maneuverable.

52" REACH

Here's a full 4'4" reach at maximum clearance! LOAdALL carries load close but quickly boosts it *'way out ahead* for easier loading . . . another advantage of Hydraulic Power Crowd.

HYDRAULIC POWER-CROWD

LESSMANN MANUFACTURING COMPANY

Affiliate of United Steel Barrel Co., Philadelphia—Wilmington, Del.

2002 Easton Blvd., Des Moines 4, Iowa

Write for Complete Information TODAY!

The Airmite pneumatic hammer and typical impact tools.

Pneumatic Impact Tool

■ A pneumatic air hammer has been introduced recently by Dotmar Industries, Inc., 103 N. Burdick St., Kalamazoo, Mich. The Airmite air hammer weighs only 3½ pounds without a tool, is 7 inches long, and fits the hand like a pistol. It has a convenient firearm-type trigger. A recessed air-control screw in the handle turns to adjust air flow in order to increase or lessen the impact.

The manufacturer reports that the recoil has been eliminated by the fast reciprocation of the plunger. There is only one moving part. A spring grip chuck prevents tools from falling out.

Tools are inserted by slight pressure. Safety ports release air when the tool is idling. The hammer will not operate unless the tool is pressed against work. The air hammer operates on air pressure as low as 40 pounds and uses 3.5 to 8 cubic feet of air per minute to deliver 3,000 blows per minute. A wide range of tools is available for the device.

For further information write to the company, or use the Request Card at page 18. Circle No. 383.

Trucks for Mixer Service

■ Its expanded line of six-wheel trucks for ready-mix service is shown in literature from the White Motor Co., 842 E. 79th St., Cleveland 1, Ohio. The trucks fit most operating conditions in the 4½ to 5-yard mixer class.

The brochure features the White Model 302264, illustrated with a 5½-yard mixer. According to the literature, this unit hauls 6 yards of mix, 175 gallons of water in the mixing drum, and 80 gallons of water in the flush tank.

Other White trucks are described in use as dump trucks and in a number of special services. These include units for hauling cement, blocks, and aggregates.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 441.

Armco Branch Makes Move

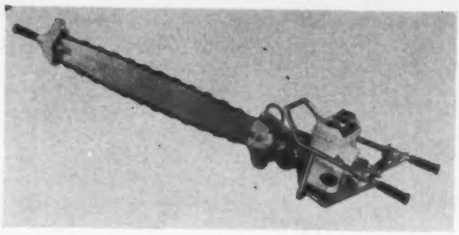
Indianapolis sales offices of the Armco Steel Corp., Middletown, Ohio, have been moved to 1839 N. Meridian St. in Indianapolis. The offices were formerly in the Fletcher Trust Building. Austin N. Edwards heads the Indianapolis district office.

Armco Drainage & Metal Products, Inc., a subsidiary of Armco, also has offices at the Meridian Street address. William Harrison is state sales manager for Armco Drainage.

Two-Man Chain Saw

■ An improved two-man chain saw is offered by McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif. The chief feature of the Model 99 saw is a new high-horsepower motor. A new fuel tank has increased capacity, permitting an additional 30 minutes of operation before refueling.

Changes also include a new type of connecting-rod bearing, an alloy-steel heavy-duty clutch rotor, and heavy-gage double-strength handlebars with cylinder fin and exhaust guard. The saw retains fingertip control, an automatic no-stall clutch, and full swivel transmission.



The new two-man McCulloch chain saw.

The company has also recently reported that it is manufacturing a line of saw chains. The Sabertooth saw chains will be available for all popular makes of chain saws.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 419.

MICHIGAN *bucket control means "Bigger Loads . . . . . FASTER"*

Watch a MICHIGAN Tractor Shovel at work —with particular attention to bucket action —and you'll *see* how a MICHIGAN* will *handle bigger loads, move more yardage*—faster, at considerably lower cost.

- *Tremendous break-out power*—ram the cutting edge into any tough, hard-to-dig clay, shale or loose rock—and *work the bucket* to loosen it
- *Bucket roll-back at ground level*—pick up and transport full buckets at low center of gravity for safe traveling, no void space in the bucket; more work in less time
- *Remarkable digging ability*—two large double acting cylinders on bucket and two large double acting cylinders on main lift give excellent control and superior digging action.
- *Good bucket height and reach*—high dumping clearance and ample forward reach make trucks easy to load.

Check these outstanding Quality Features of MICHIGAN* Tractor Shovels . . .

1. **Superior Bucket Action**—bigger loads, faster loading
2. **Clark Power-Shift Transmission**—faster operating cycle gets more yardage
3. **Clark Torque Converter**—3-to-1 torque multiplication; power when needed—no conventional clutch
4. **Clark Planetary Axle**—relieves torque load on shafts and gears, prolongs machine life
5. **Power Steering**—much easier handling, lessens driver fatigue
6. **Gas or Diesel**—right power for the job; more horsepower than any comparable machine

Six models: capacities from 1.5 cubic feet to 2¼ cubic yards. Facts about the MICHIGAN Tractor Shovel are important—and interesting. The MICHIGAN Fact Folio contains specifications and action photos. The coupon gets it for you.

*A Trademark of Clark Equipment Company

CLARK EQUIPMENT

16

CLARK EQUIPMENT COMPANY
Construction Machinery Division
384 Second Street, Benton Harbor, Michigan

Please send the MICHIGAN Tractor Shovel Fact Folio

Name_____ Title_____

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Address_____

City_____ County_____ State_____

A Wooldridge 17-yard Terra-Cobra is assisted by a Caterpillar D8 tractor as it picks up a load of dirt. Thornton Construction Co., Inc., Hancock, Mich., has the contract for the $500,000 project and will complete the job this summer. *C&E Staff Photo*

Grading Job Is Difficult in

VIRTUALLY ALL the tough working conditions are combined on the job of grading U. S. 45 through 6 miles of the Ottawa National Forest north of Watersmeet, Mich. The $500,000 project calls for penetrating the dense forest, making cuts up to 29 feet deep in wet clay and silt loaded with boulders, mucking out and backfilling swamps as much as 30 feet deep, and excavating more than 11,000 cubic yards of solid rock. The area has a high ground-water level and, to make the job even more difficult, work had to be carried on through a wet season.

Thornton Construction Co., Inc., Hancock, Mich., started the job last May and will complete it this summer. The highway, on an entirely new alignment, bypasses some of the areas which made the old road a series of frost boils each spring. Frost effects on the new route are expected to be held to a minimum by the carefully selected fill material and an 18-inch sand cushion under the 6-inch stabilized gravel surface base.

Typical Section

A typical cross section of the new grade has a roadway 21 feet wide with 8-foot sod shoulders on both sides. Round-bottom ditches are 4 feet wide and 3 feet deep. Slopes vary, depending on depth and height of both cuts and fills. Topsoil was stripped and stockpiled during grading for use on shoulders.

Within the limits of the city of Watersmeet, the project includes the construction of 2,600 linear feet of curb and gutter, a storm sewer 880 feet long, and 25 catch basins and manholes. The installation of 6,000 linear feet of 6-inch vitrified-clay underdrain was a part of the contract. A bridge near the north edge of Watersmeet was constructed under a separate contract, but Thornton's project included nearly 2,000 linear feet of concrete culverts from 12 to 60 inches in diameter.

Clearing and Grubbing

The dense growth of spruce and hardwoods was cleared by a crew using six Homelite and McCulloch chain saws. Merchantable timber, salvaged and piled beside the right-of-way, became the property of the adjacent land owner. A John Deere tractor skidded logs and assisted the clearing crew. Brush and trimmings were burned on the right-of-way.

Most of the stumps and roots were grubbed with tractors and dozers. In one area where the soil was unusually wet, a Manitowoc Model 3000 2-yard shovel removed the stumps. As roots and soil came up with each dip of the bucket, they were piled at the edge of the right-of-way. Although solid rock was only a few feet below, the soil was so saturated that the shovel had to work from timber mats.

Where peat swamps were encountered, the unstable material was removed by a Koehring 1¼-yard dragline with 60-foot boom and a Bucyrus-Erie 22-B dragline with a Pettibone Mulliken ¾-yard bucket. Swamp excavations were

Building a Reputation

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For years, the Ætna Casualty and Surety Company has been providing contractors with surety bonds — promptly and efficiently. That's why the Ætna has grown with the construction industry, why contractors everywhere turn to the Ætna for their bonding needs.

The next time *you* need a bond, why not join the many hundreds of leading contractors who bond with Ætna — always.

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ÆTNA CASUALTY AND SURETY COMPANY

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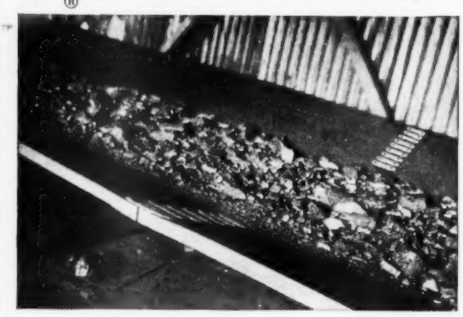
BELT FASTENERS and RIP PLATES



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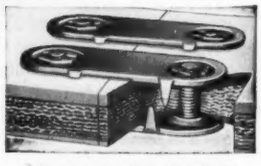
★ FLEXCO Fasteners make tight butt joints of great strength and durability.

★ Trough naturally, operate smoothly through take-up pulleys.

★ Distribute pull or tension uniformly.

★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.

★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.



Compression Grip distributes strain over whole plate area

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FLEXIBLE STEEL LACING CO., 4608 Lexington St., Chicago 44, Ill.

cult in Wet Soil and Rock

Caterpillar 60 scrapers, pulled by D6's, move earth on U. S. 45 in Michigan. At upper right, a LeTourneau scraper used on the realignment project is pulled by a Cat D8.
C&E Staff Photo

backfilled with selected material taken from cuts or borrow pits located nearby.

Excavation

Earth-moving operations were carried on by a fleet of scrapers which included 3 Wooldridge Terra-Cobras, 2 Caterpillar D6 tractors with Cat 60 scrapers, a Caterpillar D8 with LeTourneau LP scraper, and a Euclid scraper. Four Caterpillar D6 and D8 tractors with dozers push-loaded the scrapers and spread material on the fills. While the D6 tractors with their 8-yard scrapers seemed small beside the 17-yard Terra-Cobras, their maneuverability, fast loading, and ability to travel over the soft wet spots made them valuable on the spread.

Sand for the 18-inch cushion was obtained from five borrow pits near the job. Much of this material was loaded by the Manitowoc 2-yard shovel and hauled by five Koehring Trail-Dumps. Gravel surfacing was hauled from a pit 1½ miles south of the job. Rock cuts were drilled and blasted, and the material loaded with the Manitowoc shovel and then hauled away by two Euclid UDT 9-yard trucks.

Equipment lubrication was handled daily by a well equipped lube truck which was also a shop on wheels. The GMC 4 x 6 truck carried a 4-reel Lincoln system with air, chassis lubricant, motor oil, and transmission grease available under pressure in the convenient hose reels. The truck also carried an air compressor, welding equipment, an assortment of tools, cable, and commonly needed parts.

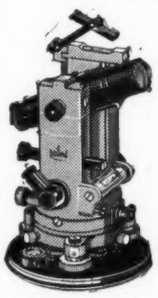
Normally, the equipment was fueled from a dealer's tank truck. When it was impossible for a standard-type truck to travel the roadbed to reach the equipment, fuel was delivered by a White 4 x 4 converted army scout car which carried

(*Concluded on next page*)

ASKANIA

MIDGET OPTICAL READING

TRANSIT TK



with erecting eyepiece and optical plummet

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EASY
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HIGHEST PRECISION

Reading 1' Estimation 6" Instrument Weight 4 lbs. ★ LOW COST

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REPRESENTATIVE
GEO-OPTIC COMPANY INC.
170C BROADWAY, NEW YORK 38, N. Y.

SO YOU WANT TO GET INTO THE ASPHALT BUSINESS--

UNIVERSAL Speed Batch . . . push-button control asphalt plant

Two men can operate it — and neither needs to be highly skilled. You have centralized control over the entire plant with electric push-button and pilot control valves. Easy to operate, clearly labeled push-button controls eliminate guesswork and make it a simple matter for the operator to speed up the production cycle.

Minimum investment required — and operating costs are low. You can make a production run or one batch, change mixes as often as you need to with hardly any delay, dry only the exact amount of aggregate to be used. Maintenance cost is low, too, with all parts easy to inspect and adjust.

A high quality plant — Like all Universal equipment, the Speed Batch Model 2000 is quality engineered throughout. For example: drying drums are heavily insulated to retain heat and increase plant output; plant is highly portable with dryer, pugmill, dust collector and all power and controls on one sturdy frame — meets highway limitations; piping is simplified, with one connection each to Bitumen and fuel supply lines.

Get full information now — Yes, this is your plant, if you want to get into the profitable asphalt business without a heavy investment. See your Universal distributor or write today for an 8 page illustrated booklet on the Universal Speed Batch Model 2000 Asphalt plant. Write Universal Engineering Corporation, 327 8th Street, N.W., Cedar Rapids, Iowa.

PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION
620 C Ave., N.W., Cedar Rapids, Iowa
A Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division St. Chicago 51, Illinois

(Continued from preceding page)

two 260-gallon tanks of gasoline and diesel fuel.

The wide variety of types of work in this project is indicated by the following tabulation of some of the quantities:

Clearing	51 acres
Grubbing	4,900 sq. rods
Earth excavation	453,000 cu. yds.
Rock excavation	11,300 cu. yds.
Surfacing, stab. gravel	35,000 tons
Sodding	60,000 sq. yds.
Culverts, 12 to 60 in.	1,998 lin. ft.
Storm sewer, 12 in.	881 lin. ft.
Vitrified-clay drain, 6 in.	6,000 lin. ft.
Curb and gutter	2,600 lin. ft.

Personnel

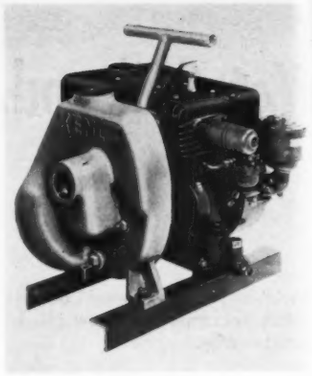
The superintendent of the job for Thornton Construction Co. was Frank Walton, and the engineer was Ward Frea. For the Michigan State Highway Department, Michael Skovera was project engineer, and Milton Bonz and Ettiore Trevis were inspectors. Charles M. Ziegler is commissioner of the Michigan Highway Department, Harold Rathfoot is road construction engineer for the department, and Robert A. McCormick is construction engineer of District No. 1, in which the project is located. THE END

CUT TIME and LABOR COSTS
in preparation for Seeding . . .
with PIXTONE *The New Mechanical Stonepicker*

Pixtone picks up, carries, dumps stones 1" to 8" in diameter—a big help to anyone doing landscape work. Saves bulk of raking time in preparing for seeding along new highways, around schools and other buildings, parks, airports, etc. (Photo shows where PIXTONE made one pass through a stony field.)
Write today for free literature.
BRIDGEPORT IMPLEMENT WORKS, INC.
DEPT. E, STRATFORD, CONN.

Shuler Elects Carson

The election of Richard C. Carson to the office of vice president in charge of engineering has been announced by Shuler Axle Co., Louisville, Ky., a subsidiary of the Fuller Mfg. Co., Kalamazoo, Mich.



The Model 114 Kenco pump.

Self-Priming Pump Is Portable Unit

■ A portable pump for contractors is suitable for dewatering flooded areas, liquid transfer, pumping out pits or quarries, providing a water supply for mixers, and similar uses. The pump is being offered by Kenco Pump Co., 1125 N. Ridge Road, Lorain, Ohio.

The Model 114 portable pump is self-priming, yet has no valves or moving parts other than the motor, pump impeller, and seal. It delivers over 100 gpm at the lowest head, and is capable of forcing water to a maximum height of 100 feet. A high-suction lift is assured up to and including 25 feet of lift.

The pump has an open-faced nonclogging impeller. It will handle all of the solids passed by the suction strainer at the end of the suction hose. The impeller is fastened directly to the engine shaft and has no couplings, keyways, or other intermediate devices. It is positioned on the threaded engine shaft in such a way that it is maintained tightly in position by engine rotation. The impeller is removed by unscrewing it from the engine shaft.

Adjacent to the impeller face is a 3/16-inch-thick steel wear plate, fastened to the pump casing by two heavy countersunk-head carriage bolts terminated on the outside by sealed-dome nuts. Intake and discharge connections are tapped for a 1½-inch pipe thread. A pipe plug is provided for drainage in freezing weather.

The pump is powered by a Briggs & Stratton 1½-hp engine. The weight of the pump and engine together is 65 pounds.

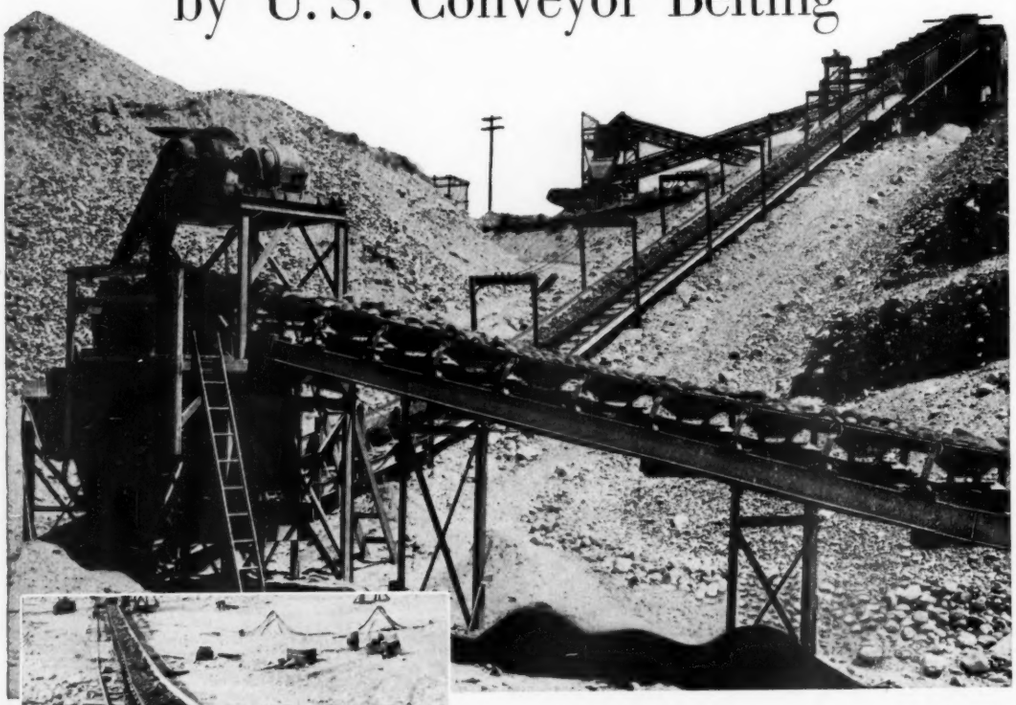
For further information write to the company, or use the Request Card at page 18. Circle No. 394.

Booklet on Using Lime In Road Stabilization

Using lime to stabilize soil or a soil-aggregate mixture for the construction of road bases or subbases is treated in "Lime Stabilization of Roads", published by the National Lime Association. The booklet traces the development of the method and discusses its applications, potentialities, and limitations.

The book contains 21 photographs and 21 combined graphs, charts, and tables, as well as a selected bibliography of 24 different references. A copy of the booklet can be obtained, on request, by writing the association at 925 15th St. N. W., Washington 25, D. C.

The roughest haulage for the Chief Joseph Dam is handled by "U.S." Conveyor Belting



Note large and jagged aggregate on "U.S." Belt at Chief Joseph Dam. The belt starts the material from the pit to the rock plant. Upper photo shows another view.

The Chief Joseph Dam in the State of Washington will have the world's largest single unit powerhouse under one roof. In generating capacity, it ranks second only to Grand Coulee. Nearly 2 million cubic yards of concrete are going into the Dam's construction.

The raw aggregate ranges from fine sand to extraordinarily heavy boulders as large as 20" in diameter. The rock breaks clean, leaving sharp edges which are good for concrete interlock but very bad for ordinary conveyor belting. To handle this most critical portion of the haulage, United States Rubber Company conveyor belts were selected. Although now in their fourth construction season, the belts are still going strong, and have given *no difficulties or maintenance problems*. This is another example of U.S. Rubber's *Three-Way Engineering* in which "U.S." Belt engineers worked with the designers of the conveyor system and the engineers of the dam—to make sure of obtaining the *right* belt.

The latest pioneering development of "U.S." Belt engineers is the Nyton breaker strip. The nylon used in this breaker adds flexibility and greater resistance to impact.

For complete information, call any of our 26 District Sales Offices, each staffed with engineers, or write to address below.

"U.S." Research perfects it.
"U.S." Production builds it.
U.S. Industry depends on it.

US RUBBER
UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.
Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes
Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

The Model TM Hough Payloader features improved four-wheel drive and new attachments.

Standby Electric Plants

■ A new folder, describing its complete line of standby electric plants, is offered by D. W. Onan & Sons, Inc., University Ave., S. E., Minneapolis 14, Minn.

The folder describes the company's wide selection of emergency electric-generating plants meeting the code of approval of the Pennsylvania Industrial Board. Both gas and gasoline-driven models are illustrated in sizes ranging from 1,000 to 30,000 watts ac.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 376.

now...you can RENT

The *Neo-Flasher* BARRICADE

FOR NO MORE THAN THE OPERATING COST OF ONE KEROSENE TORCH

NO MESSY KEROSENE • NO BARRICADES TO BUILD • NO STORAGE PROBLEMS • NO WEEKEND PREMIUM LABOR • NO CAPITAL INVESTMENT

Neo-Flasher Steel Barricade Model A Equipped with reflectorized steel panel, Neo-Flasher Model 1-100-LSR, tamper proof switch and locking device. Your name plate at slight extra charge.

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407-c COMMERCIAL CENTER ST. • BEVERLY HILLS, CALIF.

Towing-Tractor Model Gets New Attachments

■ New attachments and improvements on the Hough four-wheel-drive Model TM Payloader towing tractor include pusher and towbar plates, an air compressor attachment, a hydraulically driven winch, single or dual railway couplers, a switchman's platform and catwalk, and four-wheel vacuum-booster brakes. The Frank G. Hough Co., manufacturer of the tractor, reports that the unit now has twice the braking capacity with less operator effort, as the result of the new brakes. A four-speed full-reversing transmission, torque-converter drive, and power steering are standard features.

Long pusher or short towbar plates can be supplied for the front or rear of the TM tractor. When the tractor is used for hauling trailers, connections can be furnished to permit operation of vacuum brakes on the trailer through the tractor's new air compressor. The rear-mounted hydraulically driven winch, now available for this machine, has a line-pull of 30,000 pounds.

For further information write to The Frank G. Hough Co., 762 Seventh St., Libertyville, Ill., or use the Request Card at page 18. Circle No. 465.

Aluminum Bridge Railings

■ Bridge railings of Alcoa aluminum are discussed in literature from the Aluminum Company of America, Alcoa Building, Pittsburgh, Pa. The booklet lists advantages of aluminum alloy bridge railings, and covers engineering and architectural considerations in some detail. It gives locations of some aluminum-alloy railing installations. Other sections are devoted to suggested designs, suggested components, and specifications for design and construction.

Lightness, strength, and ease of fabrication are among the characteristics of the aluminum alloy discussed. Other features are low initial cost, good appearance, freedom from maintenance, and resistance to atmospheric attack. The booklet also stresses that parts required for railings are available in Alcoa aluminum alloys.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 436.

Savin Construction Corp. blasts ahead with 6,000 CFM of

GYRO-FLO

ROTARY COMPRESSORS

NEW YORK CITY to Buffalo — non stop. That's the fabulous N. Y. Thruway, scheduled for completion in 1954. To speed construction of two sections of this super-speed highway, in the Catskill and Albany areas, the Savin Construction Corporation of East Hartford, Conn. is using ten 600-cfm Gyro-Flo portable compressors.

The compressor engineer on this job likes the Gyro-Flo because, "It's got fewer wearing parts so it's bound to give you less trouble." Truer words were never spoken. Gyro-Flo *rotary* compressors have no pistons, rings, rods, valves or clutches. Output is smoother, steadier and *cooler*—air temperature never exceeds 200°F.

Now available in 125, 210, 315 and 600 cfm sizes, there's a Gyro-Flo portable that's *right* for any construction job. Your nearest Ingersoll-Rand distributor or branch office will be glad to tell you all about it.

One of Savin Construction Corporation's ten Gyro-Flo 600's, supplying two I-R Wagon Drills equipped with air hoists for easy maneuverability over rough ground.

This battery of four Gyro-Flo 600's operated *nine* Wagon Drills — on the Savin project near Catskill, N. Y.

Ingersoll-Rand

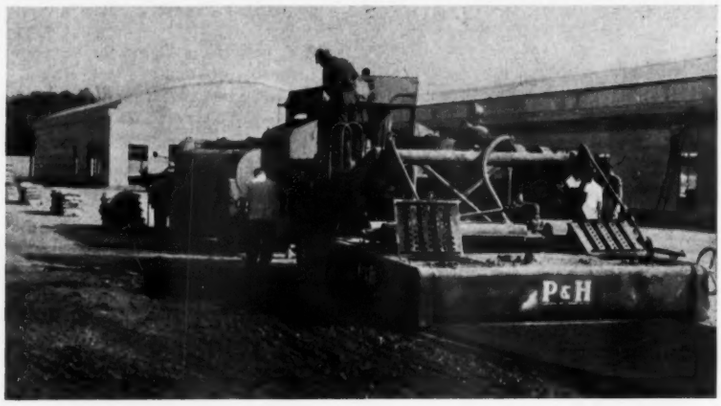
11 Broadway, New York 4, N. Y.

CONTRACTORS' COMBINATION

COMPRESSORS
ROCK DRILLS
AIR TOOLS
TURBO BLOWERS
CONDENSERS
CENTRIFUGAL PUMPS
DIESEL AND GAS ENGINES

2-27

Soil-Cement Is Used to Pave Parking Area



A P&H single-pass stabilizer pulverizes the soil and mixes soil, cement, and water in one operation. G. J. Goudreau & Co., Cleveland, Ohio, community builders and developers, constructed this parking area as part of a shopping-center project.

By GEORGE J. GOUDREAU,
G. J. Goudreau & Co.,
Cleveland, Ohio

Clay mixed with portland cement and water produces durable surface, eliminates hauling much material

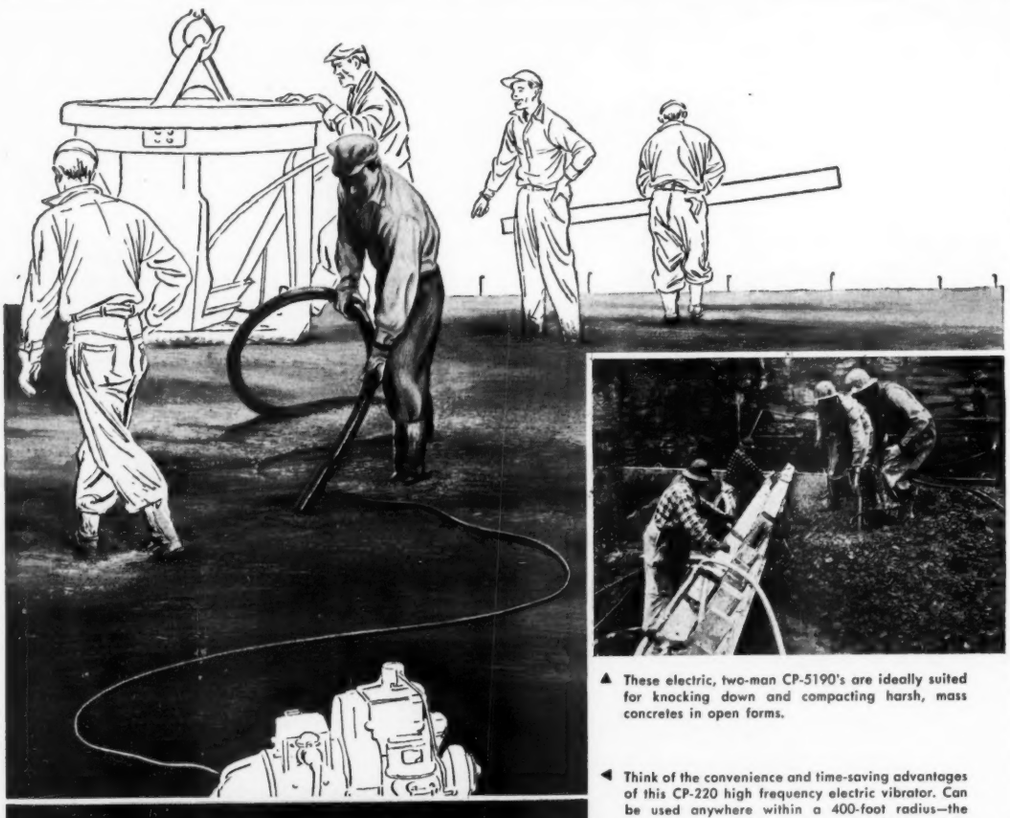
ECONOMY, SPEED, and durability were factors taken into account in the decision to construct soil-cement parking facilities at the Meadowbrook Merchandise Mart in North Bedford, Ohio. The paving job is part of a shopping-center project being built by G. J. Goudreau & Co., Cleveland, Ohio, community builders and developers.

Although not essentially a paving contractor, the Goudreau company undertook construction of the 52,000-square-yard parking area because no subcontractor was available. The necessary equipment was obtained and the company went ahead with the paving so as not to delay the entire project.

The Goudreau company decided on soil-cement after studying records which showed the material was economical to prepare, required a minimum of hauling to the site, and could be placed speedily. Although costs ultimately were higher than had been expected, the firm was completely satisfied with the job.

Tests were made of the surrounding clay soil, in combination with portlant cement and water, to determine the proportions needed to produce a hard surface. It was found that 14 per cent cement, or about 66 pounds for each square yard 6 inches thick, would be required to build a surface that would resist either softening from rain or crumbling from freezing.

In order to prevent wet clay from clogging the stabilizer during the mixing operation, approximately 1 inch of loose bank-run gravel was spread over the surface and scarified into the top 6 inches of clay before cement-spreading operations began. This actually involved no additional cost, since it reduced the



▲ These electric, two-man CP-5190's are ideally suited for knocking down and compacting harsh, mass concretes in open forms.

◀ Think of the convenience and time-saving advantages of this CP-220 high frequency electric vibrator. Can be used anywhere within a 400-foot radius—the generator doesn't have to be moved from spot-to-spot.

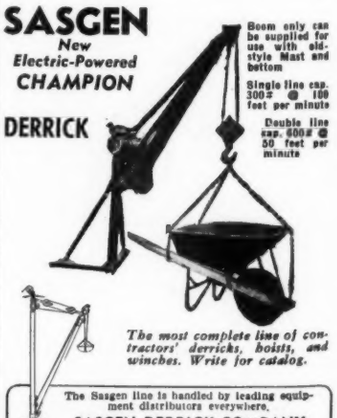
Your Vibrator
Is As Important
As The Man Behind It

Of primary importance in vibrating concrete is the operator—he alone controls the quality of his work. Of equal importance is the selection of the right vibrator for the right job. That's where CP can be of help! Whatever the conditions, there's a CP Vibrator suited to the specific job requirements. The complete line of CP Vibrators includes seven different Pneumatic and High Frequency Electric Vibrators in one and two-man types and in frequency ranges to 10,000 VPM. For more details write *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

SASGEN
New Electric-Powered
CHAMPION
DERRICK



Boom only can be supplied for use with old-style Mast and bottom

Single line cap. 300# @ 100 feet per minute

Double line cap. 600# @ 50 feet per minute

The most complete line of contractors' derricks, hoists, and winches. Write for catalog.

The Sasgen line is handled by leading equipment distributors everywhere.

SASGEN DERRICK COMPANY
3131 W. Grand Avenue, Chicago 22, Illinois

While an Adams motor grader shapes the area to final grade, a Galion steel-wheel tandem roller compacts the soil-cement mixture. Water was added to the surface immediately after this rolling to replace moisture lost through evaporation.

Final rolling of the 52,000-square-yard surface was done with a Bros pneumatic-tire roller. Asphaltic emulsion was then added as a protective cover.

necessary cement content from 14 to 13 per cent.

Cement was shipped to the site in bags, as unloading facilities for bulk cement were unavailable. Several attempts to use a mechanical spreader hitched to a truck failed when the paper bags got caught in the spreading mechanism. Finally, it was decided to spot the bags of cement in the mixing lane and spread the piles with hand lutes (toothless rakes) in front of the mixer.

Mixing Operation

A P&H 10-foot single-pass stabilizer was obtained from the Western Engineering & Contracting Co. to do the mixing. The machine chewed up the top 6 inches of clay and mixed the added gravel, cement, and water all at the same time.

At first, the machine traveled an average of 10 feet per minute, but as work progressed, the speed was stepped up to 18 feet per minute. The mixture was compacted with a single-unit sheepsfoot roller and subsequently rolled with a Galion steel-wheel tandem roller and a Bros pneumatic-tire roller.

Even 4 inches of snow, which fell shortly before completion of this operation, failed to delay the job. The snow was bladed to one side or often it was simply incorporated into the mixture.

Between compacting rolls with the steel-wheel roller and the pneumatic-tire unit, water was sprayed on the area to replenish moisture lost from the mulch by evaporation. A routing broom drag was used next to fill pitted areas caused by rock pulls under the motor grader which was used to shape the mulch.

(Concluded on next page)

This Hayward Class K has what it takes for the toughest bucket service —extreme simplicity, no contact between closing mechanism and load, minimum movement of rope.

The Hayward Company
50 Church St., New York 7, N. Y.

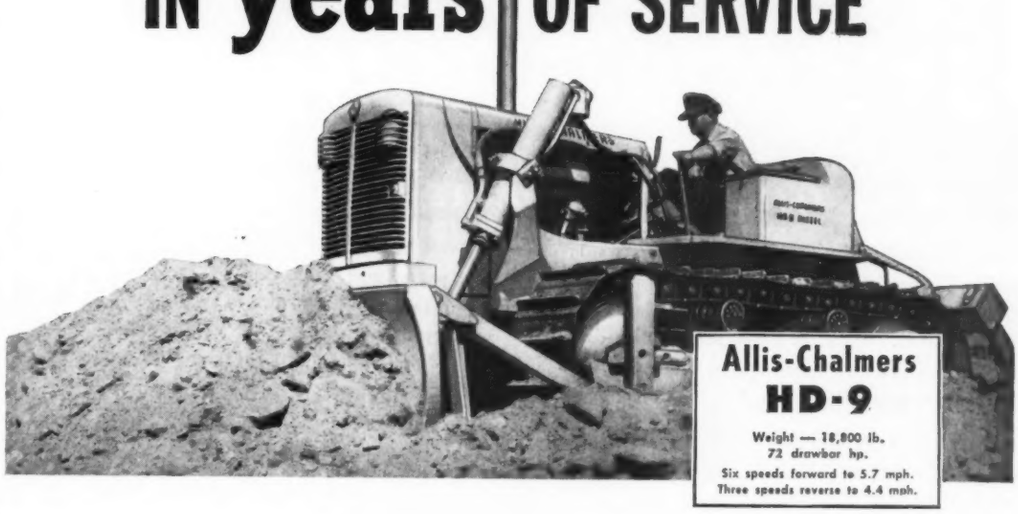
HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

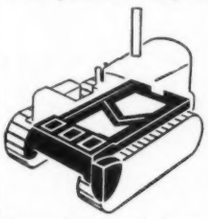
famous for performance since 1888

HERE'S TRACTOR VALUE YOU CAN MEASURE

IN yards PER DAY... IN years OF SERVICE



The Allis-Chalmers HD-9 Tractor offers performance reliability and ease of servicing that pays off in year-after-year efficiency. Here's what we mean:



BUILT TO STAND THE GAFF OF DAILY USE FOR YEARS...

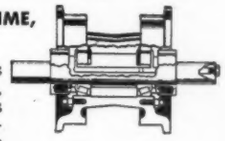
One-piece, welded main frame forms a continuous, strong backbone that means longer life for each tractor.

Oil-enclosed track release mechanism keeps adjustment at required setting and reduces track maintenance and breakage.

Smooth, efficient power train gives extra life, greater ability to absorb the punishment of tough jobs for every gear, shaft and bearing in the tractor.

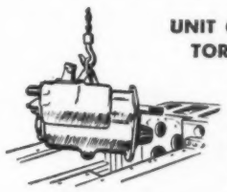
A-type truck frames permit free track oscillation and eliminate twists and strains caused by rough terrain.

EASIER LUBRICATION SAVES TIME, HELPS PROTECT EQUIPMENT



Lubrication period of 1,000 hours for final drives, truck wheels, idlers and support rollers saves both grease and time. Spring-loaded, Positive Seals keep grease in, keep dust and water out.

Fewer, more accessible lubrication points make short work of a chore. No lube points at all under tractor.



UNIT CONSTRUCTION PUTS TRACTORS BACK TO WORK SOONER

Transmission can be removed as a unit without removing clutch, final drive or bevel gear.

Engine can be removed without disassembling clutch.

Truck frame can be dismantled without removing final drive, sprocket or equalizer spring.

Clutch assembly can be removed without disturbing engine or transmission.

Final drive gear and intermediate gear can be removed without disturbing steering clutch.

Each steering clutch can be removed independently without disturbing final drive or bevel gear.

• • •

Let your distributor tell you more about the rugged construction, ease of servicing and outstanding performance ability of the Allis-Chalmers HD-9 Tractor. It's a story that adds up to value you can measure in yards per day and in years of service.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

(Continued from preceding page)

Asphaltic Cover

Asphaltic emulsion was applied as a protective cover for the soil cement. This operation sealed moisture in the compacted base and permitted the cement to hydrate and bond the soil particles together. Where immediate use of the area by traffic was anticipated, a sand blanket was spread over the bituminous surface.

In addition to the major steps already outlined, the job included several grading operations as work progressed. The entire area was, of course, first shaped to grade before construction of the surface began. After the bank-run gravel was added and the top 6 inches of clay scarified, the section was again graded to provide a level surface for spreading the cement.

Neither expansion nor contraction joints were used on the job, and no forms were required to confine the mixtures during mixing, compacting, or finishing operations. Still, an even and firm surface resulted.

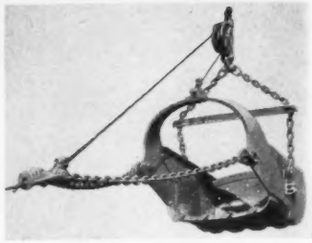
Wetting of the compacted soil-cement surface prior to application of the asphaltic emulsion had the effect of forming a vacuum under the asphalt cover. This vacuum tended to hold the surface and base together, and as the soil-cement hardened, the two materials formed one solid pavement.

Additional Costs

Factors contributing to the additional costs over and above the original estimate for the job included hauling the stabilizer from Hart, Mich., the necessity for overtime wages in order to assure completion of the job in as short a time as possible, and the fact that the company had not previously had experience with soil-cement. In spite of these facts, officials of the firm felt the result was well worth the total cost.

Goudreau & Co. was impressed especially with the facts that soil-cement may be placed in intemperate weather and that it can be used to span soft areas and small voids in the subgrade. These advantages, added to the speed of placement and the fact that surrounding soil can be used at minimum cost, indicate the material can be used at considerable saving. THE END

From a paper presented at a meeting of the American Road Builders' Association in Atlantic City, N. J.



The Page lightweight dragline bucket for sand and gravel digging.

Lightweight Bucket Digs Sand and Gravel

■ A lightweight dragline bucket with lip and tooth points cast of high manganese steel is made by the Page Engineering Co., Dept. RL, Clearing Post Office, Chicago 38, Ill. The bucket has resistance to wear and shock when digging clay, earth, sand, or gravel.

Unusually sharp teeth, mounted in bases cast integrally with the thin but strong cast lip, enable this lightweight bucket to penetrate and cleanly dig these materials. The manufacturer points out that the combination of digging ability and decreased dead weight on the boom means more payload per pass.

For further information write to the company, or use the Request Card at page 18. Circle No. 353.

New International Office

The International Harvester Co., Chicago, Ill., recently opened its new motor truck district sales office in Lubbock, Texas. The new facility, located in the Stanolind Building, serves about 125 International motor truck dealers in addition to four International sales branches in the states of Texas, New Mexico, and Oklahoma.

Heading the new sales office is R. H. White, formerly motor truck district sales manager at Tulsa, Okla. He will be assisted by M. S. Howard, former assistant manager of the company's Sweetwater office.

PROVED LEADERSHIP in IGNITION

Fairbanks-Morse SUPER SPARK Magnetos and Battery Ignition Units have proved superiority and leadership over many years of service.

FIRST to build a simple compact battery ignition unit with coil inside the housing. FIRST to build magnetos and battery ignition units with standard flange to mount on tractors.

Specify Fairbanks-Morse and you specify the "best".

FAIRBANKS, MORSE & CO.

Magneto Division Beloit, Wisconsin

FAIRBANKS-MORSE

A Name Worth Remembering

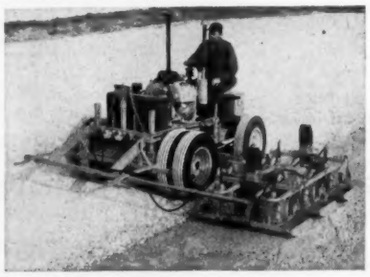
The JACKSON VIBRATORY COMPACTOR

FAST • EFFICIENT • VERSATILE

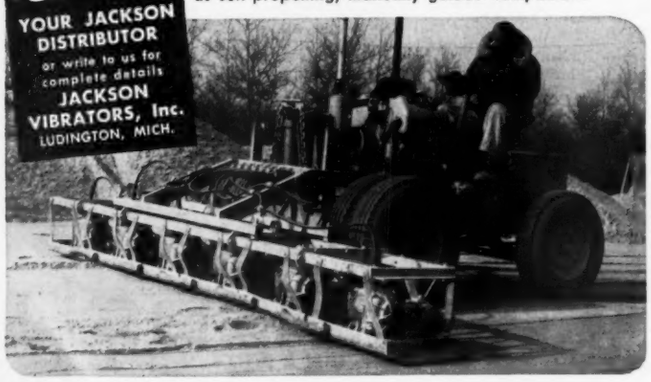
ON MACADAM CONSTRUCTION . . . In one pass it will sufficiently compact 12" of rock to support smooth rollers. In four passes it achieves final density. And when sufficient fines are spread, one pass suffices to fill all voids. In GRAVEL SUB-BASES (blanket course) 7" thick, this machine has achieved 98% Standard Proctor in one pass. Standard width is 13', 3". Working speeds: 0-60 F.P.M. Reverse travel speed: 5½ MPH.

COMPACTS WIDENING STRIPS IN ONE PASS . . .

IN ANY GRANULAR MATERIAL used in flexible base-course widening. For this purpose compacting units are assembled in tandem, (3 deep, single or double row) and towed at side of tractor. Compactor bases of 12" and up may be substituted for standard 26" bases to suit requirements.



SAND FILLS, SUCH AS BRIDGE APPROACHES . . . another spot in which this machine shines. It's rapid and gets into places inaccessible to larger equipment. For the really tight spots one or more of the compacting units may be fitted with operating handles and used as self-propelling, manually guided compactors.



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PILE HAMMERS

Rugged strength, simple design, positive action. Delivers twice the usual number of blows per minute with 25 to 35 per cent less steam per blow.

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Manufacturers of Pile Driving Hammers and Pile Extractors Since 1852

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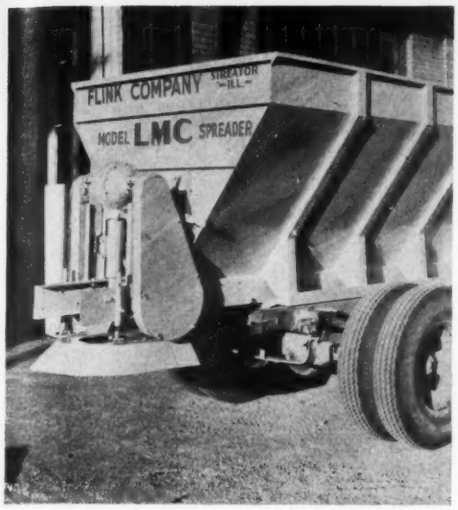


The new Flink Model LMC spreader is one of two new pieces of equipment announced by the company.

Hopper-Type Spreader and Road-Broom Drag

■ A hopper-type cinder spreader and an aluminum road-broom drag are two new products offered by the Flink Co., Streator, Ill. The new Model LMC materials spreader features a gear drive that consists of two helically-cut steel pinion gears operating in oil on a single helically-cut ring gear which is in a sealed housing. There are no worm gears or miter gears.

Power may be derived from the power takeoff or from a separate air-cooled engine. The conveyor is driven from both sides, power being equalized through a differential. All drives are in line. This is accomplished by running the main drive shaft in oil in a sealed tube through the center of the hopper.

The second item, a road-broom drag made entirely of aluminum, is available in a single 7½-foot section or double 15-foot section. Each section, including brooms, weighs approximately 60 pounds.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 403.

Booklet on Excavators Features Line of Hoes

■ Large illustrations, featuring all sizes of Lorain hoes, are shown in a new picture booklet recently published by the Thew Shovel Co., Lorain, Ohio. It covers the entire Lorain line, from the new ⅜-yard Model MC-104 to the 2-yard Model 820, using job photos to graphically illustrate the story of hoe application. Shown are the new extra-long booms and sticks adapted for deep digging with the ¾-yard Lorain TL-25's and the 1-yard Lorain 50's.

The hoe booms are built for use on all models in the line and are interchangeable with booms available for any given model. A range of hoe booms from 14 to 25 feet in length and dippers with cutting widths of 24 to 62 inches are shown on jobs throughout the country.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 466.

Mortar-Board Stand

■ A catalog sheet of its mortar-board stand has been announced by the Waco Mfg. Co., Dept. KP, 3565 Wooddale Ave., Minneapolis 16, Minn. The literature describes the unit's adjustability and strength, and the stand is pictured in color.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 422.

CONCRETE IS REMOVED to depth of 1½" by Tennant 25 hp chipping machine.

NEW chipping machine does 12-day concrete removal job in 5 days

Use of a new high-speed concrete router cut 7 days off surface removal time on this Wisconsin bridge-retopping job.

Workman checks depth of cut.

In 40 hours, Tennant machine chipped 1½" of 4000-lb.-test concrete from 94' x 20½' area. Eau Claire contractor L. G. Arnold *completed job 58% faster than could have been done with air hammers.*

Machine's 1600 rpm cutter head chips 4"-wide strip; cuts through aggregate stones but leaves them tightly embedded; provides even over-all cut; leaves good bonding surface for new topping. Interchangeable cutter heads adapt machine to cleaning pavement joints, routing out cracks for resealing, leveling humps, many other jobs. Has 25 hp engine, optional 14" diamond blade concrete saw, water tank.

Write today for details.

G. H. TENNANT COMPANY
2534 No. 2nd St. • Minneapolis 11, Minn.

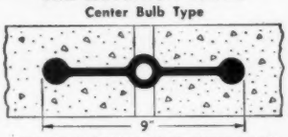
TENNANT ESTABLISHED 1870

CONCRETE-ROUTING MACHINES

INDUSTRIAL MAINTENANCE EQUIPMENT

Servicised Rubber WATERSTOP

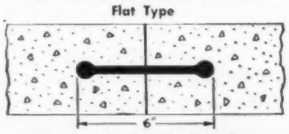
FOR EXPANSION JOINTS
Center Bulb Type



Servicised Rubber Waterstops meet all standard engineering specifications. Made of durable, elastic, cured rubber compound.

Both types available in 6", 9" and 12" widths in any required length.

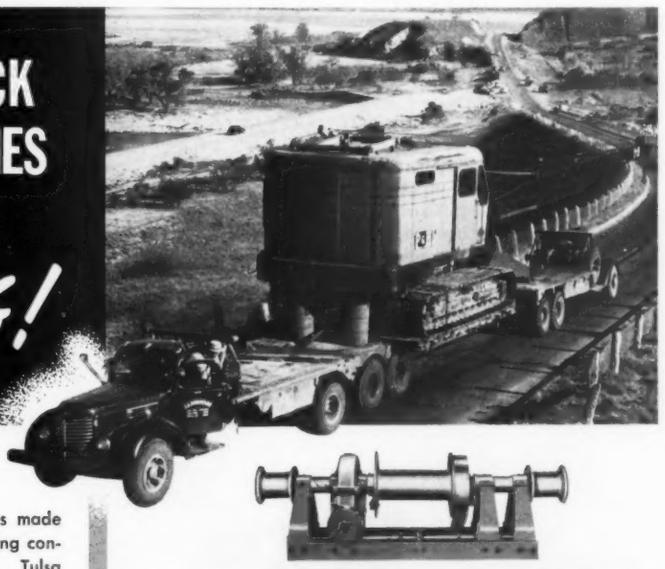
FOR CONSTRUCTION JOINTS
Flat Type



Write for the Servicised Products Catalog. Sent without obligation.

SERVICISED PRODUCTS CORP.
6051 W. 65th ST. • CHICAGO, ILL.

TULSA* TRUCK POWER WINCHES *for* HAULING!



Movement of this power shovel was made easily and quickly by a Texas trucking contractor with two truck-mounted Tulsa Winches. This is just another example of the versatility and reliability of Tulsa Winch. There is a Tulsa Winch for every make and model of truck and crawler tractor.

Tulsa* Winch
TULSA, OKLAHOMA DIVISION OF VICKERS Inc.

*Reg. U. S. Pat. Off.

"No Oil On My Concrete Forms?"

RIGHT, MISTER! Every day more and more contractors are switching to TECHNICOTE—a black plastic resin containing no oil, grease or wax. Tests prove forms coated with TECHNICOTE have been reused as many as 18 times! No on-the-job mixing—shipped ready to use. Seals moisture in concrete. No adhesion—forms are easily removed, and one 2-coat application is usually sufficient for 8 to 10 settings. TECHNICOTE was used by the William Simpson Company during construction of Television City in Los Angeles. Learn more about amazing TECHNICOTE by writing directly to us, or fill out the Readers' Request Card at page 18.

TECHNICOTE

L. J. KISSLING & SON

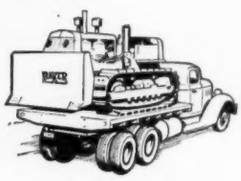
P. O. BOX 21, LONG ISLAND CITY, N.Y.

New Baker 15X—with 102 drawbar hp—combines peak yardage with portability

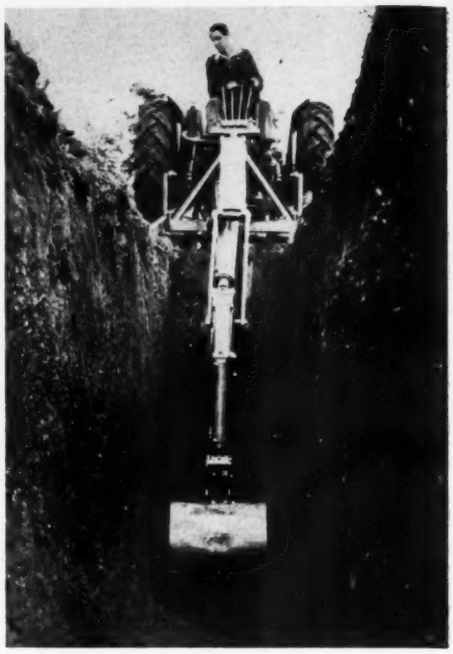
Proved on the famous 9X, Baker's revolutionary Frame-Mounted, No-Pushbeam Dozer design is already rolling up yardage records on the new, powerful *15X*.

Here is a Blade 51" high but *only 96" wide* . . . portable over any highway, day *or* night, without special permits . . . that rolls up payloads with the capacity of a standard width blade. Here is a Blade mounted closer than ever before to the radiator—a simple, *rugged* design that reduces front end weight, and provides a center of gravity that puts more weight and horsepower to *work*. Engineered for *balance*, the Baker 15X Dozer permits drawbar work with the blade left *on* — without excess wear on front-end truck bearings.

See the powerful, new Baker 15X — see it in action, where you can watch its *faster* bite, *quicker* oscillation, and payload *punch* that means *more profits per yard. Ask your Baker, Allis-Chalmers Dealer for a demonstration!*



THE BAKER MANUFACTURING COMPANY • SPRINGFIELD, ILLINOIS



This mobile trench digger, the Dinkum Digger, is one of the units on display at the British Industries Fair this month. Hydraulically controlled, it can be used as a loader, a forward shovel, or a grab for handling loose materials.

Britain Shows New Equipment at Fair

By J. FOSTER PETREE, Director and former Editor of "Engineering," a British technical journal

MODERN EARTH-MOVING machinery and other heavy-construction equipment form an important section of the British Industries Fair, being held the first two weeks of this month at Birmingham, England. The exhibit is made up of a wide range of equipment representing the newest models offered by British manufacturers.

Machinery on display ranges from large power shovels, draglines, scrapers, graders, and dozers to various power or hand tools, and includes concrete mixers and distributors, well-boring and pile-driving equipment, and pumping outfits. Other construction equipment such as scaffolding also is exhibited.

Ditching and trenching machines are among the more specialized types of equipment shown. This equipment is coming into increasingly prominent use, especially in the construction of long pipelines, and is now taking over much of the work formerly done by back-acting shovels on crawler tracks.

Also prominently displayed are large fork-lift trucks mounted on big wheels with tractor-type tires that enable them to operate over rough ground and soft surfaces. Hydraulic or pressure-oil systems are generally employed to actuate the lifting gear, a trend which grew out

TIMELY care prevents major repair

HOBBS Engine Hour METERS

tell when PROTECTIVE MAINTENANCE is needed

Powered equipment lasts longer and requires fewer repairs when a definite program of protective maintenance is followed. It pays to know WHEN it's time to change oil, lubricate, inspect, overhaul, etc. The HOBBS HOUR METER tells you when.

NOT A REVOLUTION COUNTER

. . . but an electric timing instrument that shows HOURS and MINUTES of engine operation. Provides the accuracy that's important for genuinely effective maintenance. No revolution counter can do the job!

APPROVED BY LEADING MANUFACTURERS

Installed as original equipment or recommended as an approved accessory by leading construction equipment manufacturers. Built for rough going . . . easy to install. Get full information from your factory branch, representative or distributor, or WRITE:

ORIGINATED AND MANUFACTURED EXCLUSIVELY BY

John W. Hobbs Corporation

2067 YALE BLVD. SPRINGFIELD, ILLINOIS

Britain's first heavy track-type tractor, the Vickers V. R. 180, is powered by a Rolls-Royce 6-cylinder diesel.

of the study of such devices for aircraft applications and the consequent availability of numerous high-speed and high-pressure oil pumps.

Compressed-air tools show a steady, if not spectacular, improvement in the production methods and steels used. Light metals, alloy steels, better electrical insulation, and imaginative design have gone into a variety of improved power tools for such jobs as drilling, grinding, sawing, riveting, spot-welding, etc.

A wide range of powered tractors and earth-moving equipment illustrates new developments in engine units. Post-war tractors show a swing toward diesel power. The Vickers V. R. 180 tractor, intended for working earth-moving equipment in grading, quarrying, open-cast mining, and clearance operations, uses a supercharged vertical in-line 6-cylinder Rolls-Royce engine.

Throughout the display there has been an attempt to show the development of machinery and tools which will meet the needs of particular jobs.

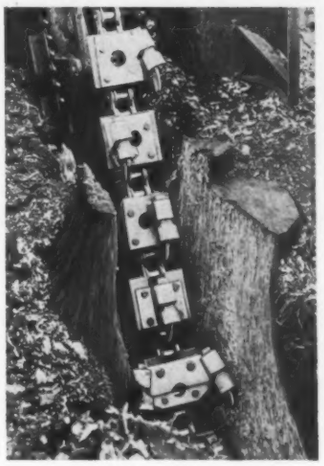
The entire exhibit allows detailed examination of post-war construction equipment, which reflects industrial efforts to produce machinery which will secure the maximum value from energy resources and human ability. THE END

New Chisel Cutters For Hard Trenching

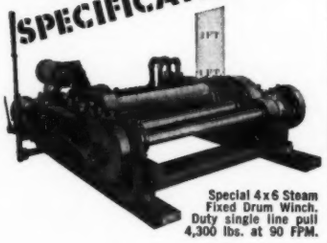
■ A new chisel cutter for its tractor-mounted trencher, the Blackhawk Trench Hog, is announced by the Arps Corp., New Holstein, Wis. The chisel cutter is designed especially for digging in hardpan, adobe clay, caliche, frozen ground, and under other tough conditions. The cutters are forged of high-carbon steel and are heat treated for toughness.

The cutters are inserted in brackets bolted to the cutter chain. Worn cutting bits may be quickly knocked out of the holding brackets, and are replaceable. They can dig 8 through 18 inches wide. The new cutters supplement the standard slicer cutters used for wet sticky soils, gumbo, heavy clay, and normal soils.

For further information write to the company, or use the Request Card at page 18. Circle No. 412.



You SET THE SPECIFICATIONS...



Special 4x6 Steam Fixed Drum Winch. Duty single line pull 4,300 lbs. at 90 FPM.

Superior-Lidgerwood-Mundy has the facilities and experience to meet them . . . either from an all-inclusive line of standard hoisting equipment or with equipment engineered to your specific requirements.

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Main Office and Works: SUPERIOR, WISCONSIN, U. S. A.
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"We cured 60 headaches by replacing 3 oils with 1"

For three years, a large midwestern road builder had engine troubles by the truckload. Sludge formed in the crankcases of *more than 60* trucks, bull dozers, scrapers and heavy roadbuilding machinery working under every condition from idling to moving tons of earth. Rings stuck. Valves were coated with heavy deposits. Oil had to be drained in 60 hours or less.

Sinclair Lubrication Engineer Carl Schmidt reports: "Oil breakdown was a big factor, even though the company was using three different oils. I suggested Sinclair TENOL®, pointing out that its superior qualities would offer maximum protection to heavy working engines, and at the same time prevent sludge formation during light duty operations. A test was conducted on 20 units using TENOL."

Engineer Schmidt continues: "The results have been excellent. Drain periods have been extended to 130 hours, with a big saving in oil. Engines are cleaner, with no valve chamber deposit. Stuck rings are a thing of the past. In addition to the direct gallon consumption savings, the use of *one* oil in place of *three* means more economical inventory control. TENOL proved so superior that after 30 days, all units were switched to this heavy duty oil."

SINCLAIR LUBRICANTS

Why not give a Sinclair Lubrication Engineer the chance to help solve your lubrication problems. There's no obligation. Contact your local Sinclair office or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

Dam Forces Relocation Of Columbia River Span

Design for county bridge is adapted to a new location as The Dalles spillway is built near original bridge site

A Bay City Crane Mobile loads structural steel onto barges which will carry the members out to the erection crane in background—a barge-mounted American Model R-30 equipped with 130 feet of boom. *Ray Day Photo*

FINDING A SITE for a bridge already designed was probably the most unusual job which fell to Tudor Engineering Co. of San Francisco two years ago. Designed for Wasco County in Oregon, the span was to cross the Columbia River a few miles upstream from the town of The Dalles. Pier foundations had been gouged into basalt rock and piers had been erected, when Corps of Engineers' studies indicated that the bridge site was an ideal location for portions of The Dalles Dam which was already under construction.

These model studies conducted at Bonneville showed that The Dalles spillway should be located on a flat shelf near the Washington shore at a point within 50 feet of the bridge. Although the Corps of Engineers had given authority to build the bridge, work on the structure halted and Wasco County was obliged to relocate the span. The federal treasury reimbursed the county for the $1,800,000 it had already invested in the bridge. Toll-fee revenue for the bridge for two years was lost, however, giving more urgency to the difficult job of selecting a similar site. And since 2,500 tons of structural steel members had already been fabricated, economy dictated the use of the bridge plans which had already been drawn.

Atkinson-Ostrander Co., which did the work on the original bridge, also held two contracts for the construction of the new span. One contract of $1,786,794 covers substructure work. The second contract, totaling $1,289,585, is for the superstructure. Work began December 10, 1952, and traffic started using the bridge this year.

Design

Except for changes in length and alignment, the general design of the new bridge is similar to the original. A sweeping curve was placed in the south end of the span where it leads into a proposed road to be built from The Dalles to California. Basically, the bridge consists of a series of piers and abutments, topped by various types of structural steel framework. Parts of the reinforced-concrete deck are carried on a rolled beam section and parts on plate girders. The main span consists of a cantilever-type truss 575.60 feet long. The smallest span spacing is 52 feet. The total length of the bridge is 3,340.40 feet.

The main bridge structure has a 22½-foot curb-to-curb deck slab of lightweight aggregate concrete which was placed without an asphalt wearing surface. The deck is 6½ inches thick over the rolled beam section, 10.75 inches thick over the plate-girder section, and 6 inches thick over the long truss sections.

Simplicity and low cost marked the design of the bridge. To save Wasco County as much money as possible,

2 ways to make crane operations pay more

1 RUD-o-MATIC
Combination Magnet Reel-Tagline

Rud-o-Matic Combination Magnet Reel-Tagline saves expensive electric cable wear on overhead and boom crane jobs. Tension on the steel tagline cable keeps the strain from the expensive electric magnet cable. Now standard equipment with major crane manufacturers, the Rud-o-Matic Combination Magnet Reel-Tagline is made in five models to fit your present equipment. Insure complete tagline control on *your* crane with Rud-o-Matic!

2 RUD-o-MATIC
Tagline

Crane operations are more profitable when you install Rud-o-Matic Taglines. Heavy duty torsion coil spring keeps tension on tagline cable at all times for bucket control. Buckets are held steady at any angle of the boom. Available in 11 models for various bucket sizes and pull out requirements. Taglines delivered fully equipped with fairlead and cable attached—ready to install. Get more pay loads per day with *your* crane with Rud-o-Matic Tagline Control!

For full information on Rud-o-Matic Taglines, call or write—

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TAGLINE CORP.
2131 E. 25th St. • Los Angeles 11, Calif.

BLACKHAWK Trench Hog

A LOW COST, MOBILE VERSATILE, TRENCHER

A Ford or Ferguson tractor mounted, versatile, small trencher with big trencher performance, digs up to 800′ per hour, with wide range of depths and widths—up to 7′ deep, 20″ wide. One man and a Trench Hog do the work of 40 hand laborers. Ideal for builders, plumbers, electrical contractors, utilities, municipalities and pipeline contractors.

- Depths accurately controlled, hydraulically.
- Cutters furnished in 6″ to 20″ widths. Easily changed to suit the job. Special cutters for tough soils and frozen ground.
- Optional equipment includes one side dirt delivery attachment to deposit spoil on either right or left side of trench.
- Crumbers available to provide clean, smooth, accurate trench bottom.
- Choice of 7 digging speeds.
- Independent wheel control for straighter line trenching and turning corners.
- Boom raises upward about 90° for transport. 4′ bulldozer available for backfilling.

THOUSANDS IN USE — EVERYWHERE

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CORPORATION
Dept. C, NEW HOLSTEIN, WIS.
PRODUCTS FOR BETTER FARMS, BETTER INDUSTRIES SINCE 1920

Tudor Engineering Co. designed simple, symmetrical, neat-lined reinforced-concrete columns and piers, planned so that form panels could be used again and again. Even the structural members were designed so that standard shapes could be utilized as much as possible.

Constructing the bridge at the new location called for refabrication of structural members already on hand as well as for considerably more tonnage. Although about 2,200 tons of steel salvaged from the original bridge were used on the new bridge, a total of 3,503 tons was needed for the new structure.

Excavation Begins

Before the new piers were constructed, several types of excavation in hard rock were necessary. Some of the pier locations, high and dry, required only minor drilling and shooting to muck out the basalt. Other pier locations were in lower parts of the river bottom where drilling, shooting, and seep-water were problems. Added to this were two subaqueous piers in mid-channel where the Columbia River is 35 feet deep. The largest of these piers has a footing 30 x 50 feet in size. All pier footings had to go at least 3 feet into solid rock.

Taking advantage of a favorable river stage, Atkinson-Ostrander encircled all but the two mid-river piers with earthfill cofferdams. Dirt for the assignment came from a borrow pit near the highway and was loaded by a Bucyrus-Erie 88-B shovel to a fleet of five Euclids. Two Caterpillar D8's with dozers helped the Euclids at the site.

Where necessary, the sites were unwatered by four low-head-type pumps, two of which were 100-hp Byron-Jacksons and two of which were 50-hp Pacific machines. Six 8-inch gasoline-powered pumps were also used on this part of the job. Soon after, wagon drills and jackhammers were moved in to drill blast holes into the solid basalt.

For the deepwater piers, the company rented a steam-driven drill boat from General Construction Co. of Portland, so that piers could be drilled and shot before steel pile cells were installed. This steam-drill scow was equipped with 6-inch drills which went down to acceptable material. The holes were loaded with 3-inch sticks of Hercules gelatin and the shots set off by Primacord detonating fuse.

A heavy structural framework was set in place to brace the tops of these cells before pumping was started. For each of these two river piers, a 28-foot-thick tremie seal of concrete was placed. Three chutes were used in each pier, and the concrete was placed with the help of long Gar-Bro elephant-type chutes. Then steel reinforcing was placed in each pier.

Concrete Construction

Construction of the concrete piers was standardized. All the work was handled by a Johnson batch plant which was set up near the carpenter yard on the left bank of the river. The concrete mix called for native sand, aggregate, and cement. Aggregates were barged upriver from Milwaukie, near Portland, while sand was sent in by river from a commercial plant near Vancouver, Wash. Oregon portland cement Type II, together with Protex air-entraining agent, was used in the mix.

All the prefabricated form panels were built in the carpenter yard on the left bank of the Columbia. Forms

(Continued on next page)

Concrete for the deck of the new Columbia River span is brought to point of placement by a Gar-Bro Power Cart. Atkinson-Ostrander Co. held contracts for work on both substructure and superstructure. *Ray Day Photo*

NEW *McConnaughay*
MULTI-PUG ASPHALT MIXER

REMOVES BOTH MOISTURE AND SOLVENTS

MODEL HTD-500

Prepares Hot or Cold Bituminous Mixtures—¼ Ton Capacity

Designed for economy of operation in the production of bituminous paving mixtures, this new McConnaughay HTD-500 Mixer is large enough (¼ ton capacity) for many resurfacing jobs as well as all types of pavement patching. Working on location, it provides the exact amount of material needed; never too much or too little. It has a low pressure burner directed into the mixing and heating unit through a combustion chamber. This HTD-500 and all McConnaughay HTD models are *the only mixers which effectively remove both moisture and solvents from bituminous mixtures* . . . giving you positive assurance that patches and resurfaced areas will set up hard as soon as the applied mixture cools. Write, wire or 'phone for details and specifications today.

McConnaughay HTD-500 at work on street patching job in Cheyenne, Wyoming.

K. E. McCONNAUGHAY
LAFAYETTE 2, INDIANA

FASTER DECKING with LOUISVILLE ALUMINUM STAGES

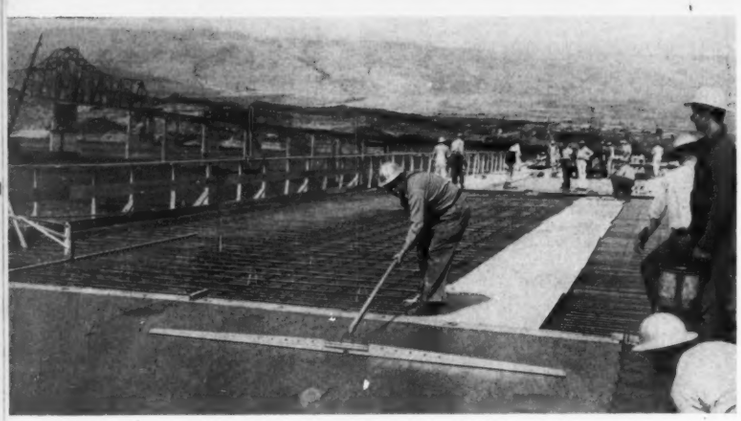
LIGHT WEIGHT — STURDY — RUGGED

20 inch wide Louisville Stages are designed for heavy contractor service. Their light weight speeds labor operations, their patented construction gives an extra long life value, resulting in lower equipment costs and decreased insurance rates. That is the report from contractors using Louisville Stages to span girders during construction of buildings with structural steel framing, bridge construction or repair work and for many other similar jobs.

WRITE FOR THE WHOLE STORY ON LOUISVILLE STAGES.

ALSO—A COMPLETE LINE OF ALUMINUM LADDER EQUIPMENT

LOUISVILLE LADDER COMPANY
1101 W. OAK ST.— DEPT. E — LOUISVILLE 10, KY.



A section of the fresh concrete is checked with a straightedge. The slab, containing Haydite expanded shale aggregate, is high in [compressive] strength. *Ray Day Photo*

for all the small column piers on the left bank were trucked to the site, set up, and installed with steel column clamps. Concrete from the ground line to a point 3½ feet above was placed with 2-inch 2 x 12 forms which were built strong enough to hold the heavy material. Above this level, shiplap facing was nailed to a series of 2 x 6 studs covered with plywood. Deck forms, also of plywood, were set on a conventional system of joists which were supported by the structural members of the bridge.

The deck slab contains Haydite expanded shale aggregate. While the resulting concrete has only 70 per cent of the weight of normal material, it is high in compressive strength. The mix was the same as that used on the Tacoma Narrows bridge deck. Compressive strengths of more than 9,000 pounds have been recorded with this mix after a year's time; it can develop 1,600 pounds compressive strength at 4 days, 3,000 pounds at 7 days, and higher strength shortly afterward. Ingredients used in a typical 1-yard bath of this mix were:

Haydite aggregate	
¾ to ⅜ inch	665 lbs.
⅜ to 3/16 inch	313 lbs.
3/16 inch to No. 4	111 lbs.
Natural sand	1,200 lbs.
Oregon portland cement	752 lbs.
Protex air-entraining agent (per sack)	1 oz.
Net placing slump	3 to 4 in.

All the Haydite expanded shale aggregate, furnished by Smithwick Concrete Products Co. of Portland, was carried between Portland and The Dalles by a fleet of trucks.

Concrete placement was started at the south end of the structure, nearest the batch plant, so that equipment had good access to concrete operations. Dry batches of the concrete mix were dropped to Rex and Jaeger truck mixers which carried 3½ to 4½-yard batches per trip. The mixers brought the concrete out to a fleet of four Gar-Bro Power Carts which, traveling and dumping from sectional timber runways, transferred the material to the point of placement. Two Viber electric vibrators were used to consolidate the concrete.

All pier concrete was cured with Hunt Process membrane, but asbestos mats were used to cure the deck slabs. These mats, arriving on the job in long strips, were unrolled over the concrete, and mat and slab were kept wet continuously. After 72 hours, the concrete was able to develop high early strength without surface checking.

Fabrication and erection of the 3,503 tons of structural steel was subcontracted to the Emeryville, Calif., combined firm of Judson-Pacific-Murphy Corp. which specializes in this work. The firm not only altered the steel fabricated for the original bridge, but also furnished all the new members. From the fabrication point, steel was shipped by rail to a siding at The Dalles, then transferred by truck to a yard on the banks of the Columbia.

Here, a Bay City Crane Mobile handled and classified the structural members, and several steel barges were used to load and transfer the material to the erection site. The main erection crane was a barge-mounted American Model R-30, a 75-ton rig, equipped with 130 feet of boom and supplied with auxiliary power and steam. It was mounted on a barge measuring 52 x 108 feet.

With the exception of the center cantilever span, the steel job was routine, with the heaviest lift coming

BACK OF THIS PUMP STANDS..

The GORMAN-RUPP Guarantee

Our distributors are authorized to put a Gorman-Rupp Contractors' Pump on any pumping job, any time, anywhere, alongside any other make pump, size for size. The Gorman-Rupp pump is guaranteed to pump more dirty water more hours, using less gasoline and to prime quicker than any other self-priming pump. If it isn't the best all around pump, our distributor will accept the return of the Gorman-Rupp pump and pay the user any installation expense incurred.

GORMAN-RUPP 125 M PUMP

Designed by experienced pump engineers, built by expert craftsmen, thoroughly tested in the factory and proven in the field.

The Gorman-Rupp is built for long, hard service. The greater capacity when working against high heads is most important. Streamlined inside, no by-passes or valves, no efficiency lost in pumping and a minimum of maintenance insures against loss of time and results in greater profit to the contractor.

Ask for Contractors' Pump Bulletin No.4-CP-11

Gorman-Rupp Pumps — SOLVE YOUR PUMPING PROBLEMS

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

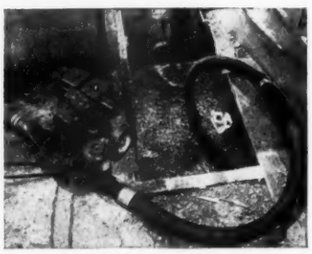
CONTRACTORS LOOK FOR MOST DEPENDABLE PUMP

Contractors are quick to recognize the advantages of having the best equipment possible on construction jobs. Any saving of time in completing a contract is a saving in man hours and also frees his equipment for the next job. Dependable pumps are a necessity on any job that involves drainage or the movement of water.

The Gorman-Rupp Company of Mansfield, Ohio, specializing in pumps only, guarantees that their pumps will outperform any pump of comparable size and type on the market.

These self-priming centrifugal pumps have long led the field in performance and dependability. The new Gorman-Rupps are the result of years of study and research in the field and in the laboratory.

Gorman-Rupp blue pumps are a common sight on tough pumping jobs everywhere. Their greater capacity when working against high heads, their great simplicity, their trouble-free operation and rugged construction make them a great favorite with contractors.



FIELD NOTES on the GORMAN-RUPP DIAPHRAGM PUMP in a SLAUGHTER HOUSE

Before the men at a Berlin Heights slaughter house heard about the Gorman-Rupp diaphragm pump, they used to flip a coin to decide which unfortunate individual got the repulsive job of cleaning out the pit into which all of the blood and other waste matter of the slaughter house drained.

The pit was about 8 feet square and 10 feet deep. The liquid was to be pumped into a storage tank which at the time the pump was installed was in the construction stage. This tank would be placed about 30 feet from the pit. The Gorman-Rupp 3D-8R6 diaphragm pump was placed at the side of the pit, making a 10-foot suction lift and a 30-foot discharge.

In order to prove the Gorman-Rupp diaphragm pump's ability to pump the liquid, the discharge hose was curled around and back into the pit. The diaphragm pump handled the liquid and waste materials smoothly, easily, and quickly.

The unit is self-priming and required no attention except supplying of fuel and starting or stopping.

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

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"A PAYLOAD EVERY TRIP"
The ONLY Bucket that DIGS-IN instead of Lifting-Out.
Write for literature.
JOS. F. KIESLER COMPANY
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to 40 tons on one of the plate-girder sections. The heaviest lift in the cantilever truss section was 12 tons. Two 200-ton Duff-Norton jacks were used under each end of a cantilever section to help make the closure joint. Since the river bottom consists of columnar basalt, some difficulty was experienced in erecting steel which required support. To support these sections at the base, steel piles were set and concrete placed by tremie method. Then the top of the piles were tied together to form the needed support.

Personnel

Field operations for Atkinson-Ostrander Co. were under the general supervision of Vernon Bradley, general superintendent, and A. H. Steiner, project manager. Tudor Engineering Co. operations were under the general direction of P. T. MacKenzie, area engineer at The Dalles, who was assisted by Clyde E. Barrett, chief inspector. Fred Madigan of the associated engineering firm of Tennison & Wall was resident engineer. THE END

New Basic Legal Guide For Construction Work

Fundamental methods of preparing contracts and specifications is contained in the third edition of "Engineering Contracts and Specifications", which has been published in a third edition by John Wiley & Sons, Inc.

The book includes new material on engineering and construction law, cost-plus-fixed-fee contracts, construction insurance, bonding practice, and contracts for architectural and engineering services. Also covered are the differences in contract procedures followed by private organizations and the government.

The entire text, expanded and largely rewritten, has sections on the law of contract, types of construction contracts, bidding procedure, and specification writing.

Written by Robert W. Abbett, a partner in a New York consulting engineering firm, the volume sells for $6. Copies may be ordered from the publisher at 440 Fourth Ave., New York 16, N. Y.

Goodman Elects Grasse

Elected vice president in charge of industrial products of Goodman Mfg. Co., Chicago, Ill., was Arthur M. Grasse, manager of the industrial manufacturing division. Mr. Grasse will continue in charge of the division and the newly acquired Diamond Iron Works line of crushing, screening, and handling equipment for rock and gravel industries.

Earth-Moving Equipment

■ The complete line of Allis-Chalmers industrial equipment is described in a newly revised general catalog. The brochure includes data on the Model HD-15 crawler tractor which is now available with a choice of two drives—a standard transmission or a hydraulic torque converter.

Also illustrated and described, along with its crawler and wheel tractors and motor graders, is the A-C line of motor scrapers and wagons and the company's line of pull-type scrapers. A section in the catalog is devoted to the selection of allied equipment and attachments.

To obtain this literature write to the Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 451.

THE NEW Ford Model 172 industrial engine with 172-cubic-inch displacement delivers 61 brake hp at 2,800 rpm. Large-bore, short-stroke, and low-friction design are features of the four-cycle engine. For further information write to the Ford Division of the Ford Motor Co., P. O. Box 638, Dearborn, Mich., or use the Request Card at page 18. Circle No. 445.

"Loads more in 3 buckets than others can do in 4"

"I'll load as much or more in 3 buckets with one of my Drott Skid-Shovels than any unit their size will handle in 4!" says Contractor James Kleager of Omaha, Nebraska.

"They're really a pleasure to operate; and with that bucket tip-back at ground level, I get a heaped load every time!"

We know that contractors like Mr. Kleager are wise buyers. They examine the facts — compare features — and choose the best value.

Drott's many patented and exclusive features make the Skid-Shovel so rugged . . . so versatile . . . so productive, that owners keep them busy on profit-making jobs all year around.

That's why Drott's whopping 451% sales increase in a one-year period is convincing proof of superiority on all counts—proof that Drott Skid-Shovels can give you more for your money — and do! Drott Skid-Shovels are designed exclusively for International TD-6, TD-9, TD-14A and TD-18A crawler tractors.

For information—write for catalog 101.

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JAMES KLEAGER, OMAHA CONTRACTOR, at the controls of one of his Drott Skid-Shovels. Says Mr. Kleager, "This is by far the best loader I've ever operated. My Drott Skid-Shovels do so many things so well that I'm really enthused about their outstanding production performance!"

DROTT SKID-SHOVELS are shown below on a rough grading job. Note the clean lines, clear vision, heaped loads and effortless control. Drott Skid-Shovels have a terrific pry-over-shoe Break-Out Action with the bucket, diverting all of the pressure in the ground and not on the tractor. This digging power is greater than the weight of the tractor. Skid-Shovels also have higher lift and greater reach than any comparable equipment. Equipped with patented Hydro-Spring, an exclusive shock-absorber on Drott equipment, shocks are reduced to less than 1/3 of their original force.

Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade or slope on which he is working.

Order from Your Equipment Distributor Today
OR
THE SLOPE-METER CO. EXCELSIOR, MINN.

A Lima Model 2400 shovel balances a big rock on its 6-yard dipper as it loads a Mack 30-ton truck with material for the breakwaters. Rock measuring up to 20 cubic yards and weighing up to 30 tons was used on the exterior of the breakwaters.

Dock and Harbor Built For Processing Plant

A 4,000-FOOT-WIDE harbor and facilities for loading and unloading Great Lakes ore boats are under construction near East Beaver Bay, Minn., as major phases of the Reserve Mining Co.'s new taconite plant project. The processing plant, together with the taconite mine at Babbitt, Minn., and adjacent harbor, railroad, and town-site facilities, represents a program costing more than $160,000,000. The entire project is probably the largest privately financed construction program currently under way in this country.

The new harbor will be utilized extensively for incoming as well as outgoing freight traffic. After the new plant is in operation, a total of 3,750,000 tons of iron-ore pellets will be shipped annually to ports on Lake Erie or Lake Michigan and thence to steel mills. On the return trip, ships will bring loads of coal for use in the power plant and in processing the taconite.

The job of transforming a section of the rugged rocky shoreline of Lake Superior into a sheltered harbor is a major undertaking. The natural shoreline consists of steeply sloping granite outcroppings strewn with huge boulders, many so large that they appear to be part of the bedrock. Offshore, occasional rock islands project above the surface, but between the islands and the shore, the water may reach depths of well over 100 feet.

The E. W. Davis Works is strategically located so that its waterfront lies between two of these islands. Pancake Island on the east is a mass of rock perhaps half an acre in size jutting up out of deep water and carrying its cloak of birch and pine trees high above the ravaging waves of the lake. Gull Island, about 4,000 feet to the west, is a lower, almost barren pile of rocks lying in somewhat shallower water.

Engineers of the design and con-

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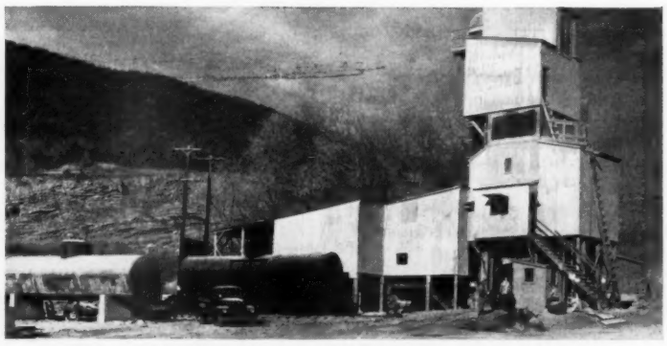

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1. **No traps — no rust — no freeze-ups**
There's no steam or water in the HOT OIL HEATER* system — the pipes and heater coils contain only high-grade heat-transfer oil. So cold weather can't bring costly plant shut-downs.

2. **Unsurpassed safety**
The HOT OIL HEATER* system gives you temperatures up to 400F *at atmospheric pressure;* there are *no high-pressure lines* in this system.

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You can heat any part of the system — storage tanks, tank cars, or trailer tanks — independently or all at once, during just the hours you want to operate. A single HOT OIL HEATER* gives you this efficiency with individual circulators for each function or with a single circulator and solenoid valves.

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MOUNTAIN STATE FABRICATING COMPANY
P.O. Box 1146, Clarksburg, West Virginia

Sheet-pile cells are filled with rock to form quay wall; 1,800-foot breakwaters constructed for taconite project

struction staff of Reserve Mining Co. visualized these two islands as the anchor points of a system of breakwaters which would protect the harbor from the waves and storms of the open lake. Today, two huge rock breakwaters join the islands to the mainland, and construction of an additional breakwater is being considered to close a part of the distance between the islands.

Building East Breakwater

Pancake Island lies about 1,800 feet offshore at the easterly end of the plant site, with depths as great as 110 feet between it and the shore. The breakwater connecting this island to the shore contains more than 1,250,000 cubic yards of loose rock. Its finished top is 30 feet wide and rises 15 feet above the lake level. Where the harbor is deepest, the bottom width exceeds 300 feet.

Maximum resistance to the action of waves and currents is obtained when the rock is in the largest possible pieces. With a Lima Model 2400 6-cubic-yard shovel and Mack 30-ton trucks which loaded and delivered most of the material, it was possible to use single pieces measuring as much as 20 cubic yards in size and weighing up to 30 tons. Many loads of smaller pieces also went into the breakwaters. An attempt was made to confine the smaller sizes to the interior of the structure and face the exterior with the largest rocks.

Rock for the east breakwater was obtained in the process of grading the plant site. In addition to the Lima, a number of other shovels were used for loading. Included among them were two Northwest 2½-yard machines and a Marion 3½-yard shovel. Euclid end-dumps hauled from these shovels and sometimes augmented the fleet of Macks working under the Lima.

(Continued on next page)

A crane handles the McKiernan-Terry 983 pile driver as it sinks sheet piles for one of the cells on the quay wall.
C&E Staff Photo

"WE SAVE TIME... Labor and Maintenance Costs with our HI-LECTRIC® CONCRETE VIBRATORS!"

says: James Farwell, Eqpt. Sup't.
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They did the job at considerable savings of time, maintenance, and labor cost, convincing me that HI-LECTRIC Vibrators will be my choice in placing concrete from now on.

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NOW one man can actually place concrete faster and better with a HI-LECTRIC than two or three men on other types of vibrators. Only the HI-LECTRIC has the "Magic Head", far lighter, far more efficient without flexible shafts or in-the-way power units. The power source may be as far as 200 feet from the vibrator and still permit one man to vibrate 1½" slump and up to 3" aggregate more quickly. *Write for new catalogue.*

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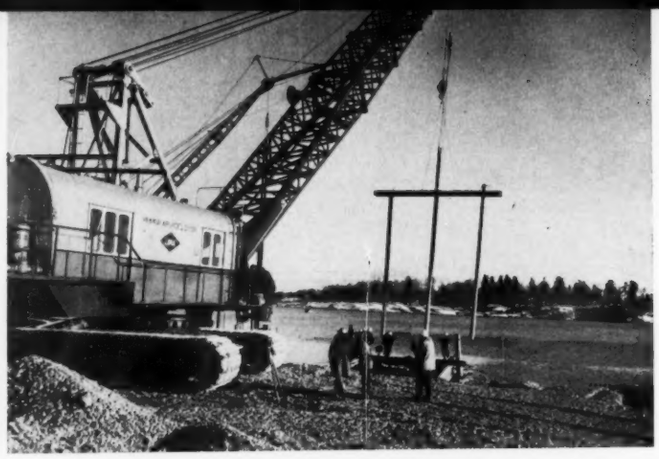


Spuds which position and anchor the template for the quay wall sheet-pile cells are set by a Lima Model 2400 crane. Pancake Island, joined to the Minnesota shore by an 1,800-foot breakwater, lies in the background across the harbor. *C&E Staff Photo*

(Continued from preceding page)

Starting from the shore, the breakwater was carried out into the lake by end-dumping and by dozing the material over the end with a Caterpillar D8 tractor and dozer. The 30-foot top of the breakwater was wide enough for two trucks to pass easily, but not wide enough to permit turning around without excessive interference with traffic. During construction of the first few hundred feet, the big trucks turned around on shore and backed out onto the breakwater to dump their loads.

As the work extended farther out into the lake and it became increasingly hazardous to back the big trucks all the way from shore, a portable turntable was installed. This device consists of a circular steel platform, large enough to support the largest truck, resting on rollers which ride a track on the subframe. An electric motor turns an automobile wheel and tire which drive the turntable by friction between the tire and the outer face of the platform.

Trucks drive out the breakwater onto the turntable, where they are turned around. They back to the end of the breakwater, dump their loads, and drive forward on the return trip to the shore. When the dump point gets to be about 300 feet from the turntable, three Caterpillar D8 tractors hook onto the skids under the turntable and move it to a new location closer to the dump.

No attempt is made to set the platform flush with the ground. Instead, two portable steel and timber ramps are set up on opposite sides to ramp the trucks up and down. Use of this simple turntable proved highly satisfactory in the construction of both east and west breakwaters.

West Breakwater

The west breakwater connecting Gull Island to the shore, although somewhat longer than the east strip, contains only about 300,000 cubic yards of rock. The maximum depth of water encountered was approximately 45 feet. Rock for this wall was quarried from nearby Matson Point and was placed in the same manner as that used to build the other breakwater.

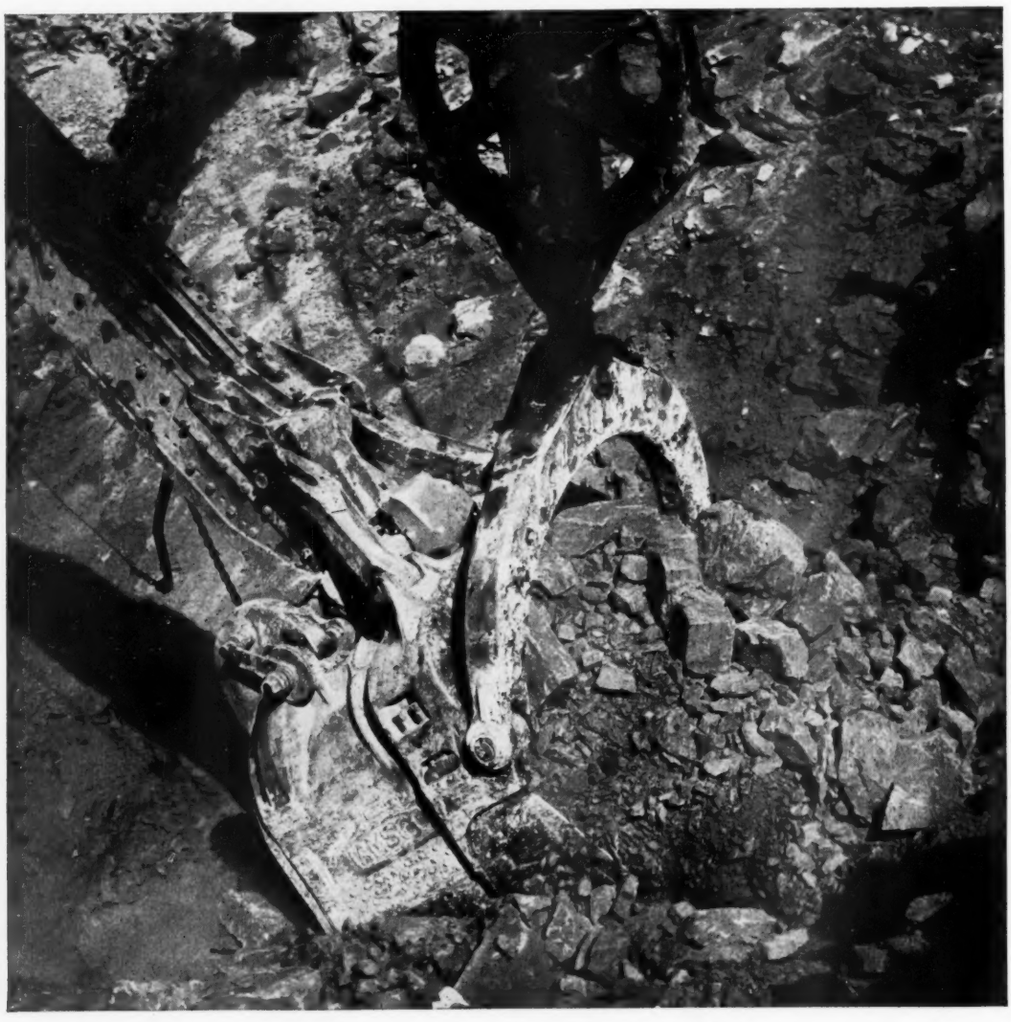
A battery of Ingersoll-Rand wagon drills, powered by Ingersoll-Rand 600-cfm Gyro-Flo compressors, drilled holes for quarrying the rock. Holes were loaded with Du Pont Gelex No. 1 60 per cent dynamite. Excavation of this rock was not a part of the grading for the present plant construction program.

Both breakwaters were built up to a level of 14 feet above the lake on the first pass. The first dumping left a large amount of space between the loose rocks, especially the large pieces. As waves, especially during storms, shook up and consolidated the pile, there was considerable settling, making it necessary to add more rock to maintain the finished elevation.

Subaqueous Excavation

Along the dock and in all parts of the harbor to be used by the ore boats, a depth of at least 30 feet of water is required. To obtain this depth, it was necessary to excavate 150,000 cubic yards of rock from the harbor bottom. This portion of the work was sublet to the Great Lakes Dredge & Dock Co., New Orleans, La.

During the summer of 1953, Great Lakes' No. 1 drill boat drilled and blasted the rocky bottom. The four



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Amsco manganese steel dippers are regularly ordered for replacement on equipment in the field. Often they go to users who found that ordinary steel dippers simply would not hold up.

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churn drills in traveling towers along one side of the boat drilled a pattern of 6-inch holes up to a maximum of 38 feet deep. The holes were loaded with Du Pont Gelex No. 1, which was then detonated to loosen the rock.

Later in the summer, the dipper-dredge Mogul came in to remove the loose rock. Two bottom-dump scows with a capacity of 1,500 cubic yards each hauled the rock to dump areas. Part of the material was used to construct an underwater levee adjacent to the dock, while the balance was dumped to build a part of the breakwater which may be constructed westward from Pancake Island. Rough weather forced the dredge to leave the site late in the fall before the work had been completed. It was scheduled to return this spring to complete the underwater excavation.

Building Quay Wall

Beginning at the east breakwater and extending 2,500 feet along the shore, a quay wall at which the ships will tie up for loading and unloading is being constructed. Sheet pile cells filled with crushed rock form the backbone of the quay. A reinforced-concrete cap along the outer side of the cells will produce a straight face for the dock.

Pile cells are 46 feet in diameter and are made up of M112 sections varying in length from 34 to 54 feet. Cells are spaced 58 feet, center-to-center, the 12-foot space between being closed by a semicircular connector cell. Where the water is shallow, the connector cell consists of a front loop only.

The harbor bottom consists almost entirely of huge boulders and solid granite outcroppings. Parts of the quay-wall foundation were excavated in the process of blasting and dredging the harbor. Other areas were so deep that it was necessary to build an underwater dike to prevent the quay cells from sliding outward down the steep rock slope. When the foundation area had been leveled, a 5-foot blanket of crushed rock was placed over the entire area.

Sheet piles were then set around a template and driven through the crushed-rock blanket by a McKiernan-Terry 9B3 hammer using air from an Ingersoll-Rand Gyro-Flo compressor. A Lima Model 2400 crane with 150-foot boom set the templates and placed the piling, while a 2½-yard crane handled the pile driving.

The interior of the cells was filled with crushed rock as soon as the piling had been driven. This rock, as well as that used for the blanket under the cells, was quarried at the extreme easterly end of the project in a quarry which also produces track ballast for the railroad and street surfacing and base material. Material for the cells was run through the Pioneer primary crusher and consisted of sizes from about 8 inches down.

Rock was delivered to the dock area in dump trucks and stockpiled parallel to the shore line. As each pile cell was set, a Barber-Greene belt conveyor was moved into position so that its discharge end was over the middle of the cell and its loading end rested on the shore. The loading end was equipped with a hopper which discharged onto the belt. Two Hough Model HM Payloaders shuttled rock from the stockpile to the hopper, keeping a continuous flow into the cell from the conveyor. A series of baffles at the

(*Concluded on next page*)

A Hough Payloader dumps crushed rock into the hopper which feeds the conveyor belt leading to the quay wall cells. A set of baffles at the end of the conveyor distributes the material evenly to all parts of the cell.
C&E Staff Photo

Put these Detour-Busters on the job

WORKING AGAINST a 20-day deadline, contractors graded and graveled a section of state highway to eliminate a long traffic detour. Here we see one of the fast moving INTERNATIONAL TD-24 and scraper teams that did the job in a hurry.

Let INTERNATIONAL Scrapers break up the slowdowns and delays that cost you money. See how they can put you back on the main road to moving dirt on time, at lower cost.

Keep the dirt flying. That's what they are made for! Everything about these big, easy-running scrapers points in one direction:

More dirt, less time on every cycle.

And how they do it! No detours here: Fast loading of bigger payloads, with less power. Improved flotation. Easy, clean dumps. Short turning radius. Remarkable stability on slopes. Rugged, simple construction that cuts maintenance to the bone!

Choose from four sizes (10 to 27.5 yard heaped capacity) to fit your job and your power. All four have the features and strength and simplicity that speed up the cycle—keep you on schedule, or well ahead of it!

Do you have dirt to move, and cost problems staring you in the face? Then there is a man you ought to know—your IH Distributor. He handles INTERNATIONAL Scrapers and can give you all the facts and figures about them. See him for "Power that Pays."

For every move in Earthmoving
ON TRACKS ...ON RUBBER
See INTERNATIONAL'S "Job-Phased*" equipment

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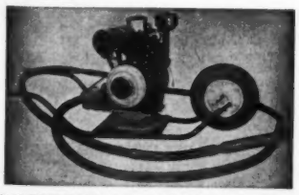
*Phased Equipment—Machines designed and built to handle each major phase of earthmoving most efficiently and economically.

ROETH



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(Continued from preceding page)

end of the conveyor distributed the material around the cell.

Approximately half of the cells had been placed and filled by the time work was shut down for the winter in December, 1953.

Immediately adjacent to the dock are extensive areas for the storage of coal and ore pellets. Coal storage docks have a capacity of 220,000 tons of bituminous coal and 100,000 tons of anthracite. Facilities for the storage of 4,400,000 tons of iron-ore pellets are being constructed under the present program.

Pellets will be handled entirely by conveyor belt systems. From the pelletizing plant, conveyors will carry the ore to huge stockpiles built over concrete tunnels. To recover the ore from the stockpiles, gates in the tunnel roof will be opened, permitting the pellets to flow down onto conveyor belts within the tunnels. These conveyors will feed the material out to the dock where it will be discharged onto movable conveyors feeding into the holds of ships tied up parallel to the dock.

Reserve Mining Co. plans construction of a plant capable of producing 10,000,000 tons of iron-ore pellets per year. Increased dock and storage facilities will be constructed to match this production as the need arises.

General contractor on the docks and harbor work, as on other construction phases of the taconite processing facility, is the joint venture known as Hunkin-Arundel-Dixon. This combine is made up of Hunkin-Conkey Construction Co., Cleveland, Ohio; The Arundel Corp., Baltimore, Md.; and L. E. Dixon Co., San Gabriel, Calif.

Project manager for the contractor is V. F. Robertson. J. R. Riggs is general superintendent of construction in the Beaver Bay area. E. C. Lampman is manager of construction for Reserve Mining Co., with H. F. Gosnell supervising the plant and harbor work for the owner. THE END

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Lindenwood, Illinois

Dipper Trip Simplifies Shovel Operations

■ The addition of an electrically operated shovel-dipper trip as optional equipment on the company's line of truck and crawler-mounted ⅜-cubic-yard power shovels is announced by The Schield Bantam Co., Waverly, Iowa. It is reported that operating speed and efficiency are increased with the new trip attachment, because it enables the operator to swing and dump loads without changing controls. A thumb-operated push-button switch, mounted on the swing clutch lever, activates an electric motor mounted on the shovel boom. The motor, in turn, winds up a dipper chain which trips the bucket dipper. Power is supplied from the basic unit battery through a solenoid arrangement connected to the dipper wind motor.

A further operating advantage is that greater dumping accuracy is made possible with the new device. The operator swings his bucket over the dump area and trips the bucket dipper on target. Loss of time involved in releasing a rope trip or some similar arrangement is eliminated by the new electric dipper trip. The swing and dump operations have been simplified into one fast cycle.

Available as optional equipment on all new Bantam shovel models, the new shovel trip attachment may also be installed on all existing models.

For further information write to the company, or use the Request Card at page 18. Circle No. 344.

Equipment Key to Profit

Wise selection of equipment is the key to maintaining a profit margin in spite of diminishing bid prices and rising costs, L. E. Schumacher, earth-moving specialist with the Caterpillar Tractor Co., Peoria, Ill., told delegates to the Georgia Highway Conference at Atlanta. Careful selection of wheels or tracks, according to the requirements of the job and judicious use of equipment may mean the difference between profit and loss, he said.

Pointing out that equipment should be selected on the basis of performance, the Caterpillar representative said production, cost per hour, cost per yard, and efficiency are factors to be considered in judging performance. Each earth-moving job, however, will present special requirements which the contractor must weigh in choosing equipment, he declared.

How is this for Flexibility in an 18-in. Diameter Culvert Pipe?

This 28-ft culvert is flexing under its own weight. Made of 16-gage galvanized sheet steel, it consists of two 14-ft sections joined by a single field coupling. Its total weight is 440 lb.

Large-diameter corrugated pipe of sheet steel has a high degree of flexibility and tensile strength. These properties allow the pipe to conform to irregular grade in a trench. They mean that the pipe can absorb changing loads caused by shifting or freezing soils, without pulling apart. And they permit it to withstand the impact and vibration of overhead traffic.

In addition, this kind of pipe weighs only a fraction as much per foot as comparable pipe of other materials. It comes in longer sections that are easy to handle without special lifting equipment, and that require the minimum of field joints.

COPPER-BEARING, CORROSION-RESISTING STEEL

Bethlehem does not fabricate culvert or drainage pipe, but does manufacture the Beth-Cu-Loy galvanized corrugated and flat steel stock used by pipe fabricators. This copper-bearing steel carries a heavy coating of zinc and has excellent resistance to corrosion. It more than meets Federal specifications, as well as those of the American Association of State Highway Officials.

If you would like further information on Beth-Cu-Loy, or if you would like to know who uses it in culvert pipe, write or phone any Bethlehem office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETH-CU-LOY *GALVANIZED* CULVERT SHEETS

BETHLEHEM STEEL

The CM puller, operated by a ratchet lever, is made in models with capacities from ¾ to 6 tons.

Ratchet-Type Hoist Works in Any Position

■ A ratchet-type hoist has been announced recently by the Chisholm-Moore Hoist Division, Columbus McKinnon Chain Corp., 6067 Fremont Ave., Tonawanda, N. Y. The CM puller lifts or pulls from any angle and is available in capacities from ¾ to 6 tons. The lightweight device is operated by a ratchet handle.

Aluminum alloy castings used in its construction have reduced the weight so that the ¾-ton model weighs only 13⅜ pounds. The unit can be used horizontally, vertically, or if necessary, in an upside-down position. An automatic friction-type load brake holds the load securely at any point. The flexibility of the Herc-Alloy welded chain used makes the device suitable for a larger variety of applications and also adds to the convenience of handling and storing the unit.

In operation, the top swivel hook is attached to some stationary object or anchor. A trigger and a button are pulled outward and given a ¼ turn to a neutral position. This provides free wheeling as the brake is released, leaving the lift-wheel free. The chain can then be easily pulled by hand in either direction so that the bottom swivel hook can be attached to the object to be pulled or lifted. The button is then turned to its active position to re-engage the brake, and the trigger is turned to the up position. Operating the handle will then lift or pull the object. Shifting the trigger to the down position releases the object so that it can be lowered by the same operation of the handle.

For further information write to the company, or use the Request Card at page 18. Circle No. 472.

Better Wire-Rope Service

■ Tips on improving wire-rope service are given in a new folder offered by the Leschen Wire Rope Division of H. K. Porter Co., Inc., 5909 Kennerly Ave., St. Louis 12, Mo. Suggestions for correct handling and storing and recommendations for the proper use of rope are included

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 473.

Sandblasting Machine

■ Literature on a line of portable and stationary sandblasting machines is offered by the Sanstorm Mfg. Co., Santa Clara and H Sts., Fresno, Calif. The models shown are designed for any type of sandblasting or blast cleaning operation. They are made for use with air compressors having a capacity of at least 13 cubic feet per minute and ranging up to 315 cfm for the larger models. Various models in the line hold 100 or 650 pounds of sand. Standard equipment includes a 12½-foot 1-inch-ID sandblast hose, a nozzle holder, a nozzle, and a filling funnel.

These machines use any abrasive, such as sand, steel grit or shot, ground apricot pits, and clover seed, that will slide freely on a 45-degree angle. A feature is a swivel arrangement that makes it possible to direct the blasting hose in any direction regardless of the machine's position.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 437.

Need information on equipment? See Request Card at page 18.

Ferro Elects Herbert Mode

Herbert C. Mode has been elected a vice president of The Ferro Concrete Construction Co., Cincinnati, Ohio, a subsidiary of Turner Construction Co. Mr. Mode has been with the Turner organization since 1924.

PREFERRED by CONTRACTORS
Less initial cost — Lower upkeep
MARVEL
CONCRETE VIBRATORS
GV-1, GV-2 & GV-3 MODELS NOW EQUIPPED WITH AUTOMATIC CENTRIFUGAL CLUTCH AS STANDARD EQUIPMENT. INTERCHANGEABLE FLEXIBLE SHAFTS.
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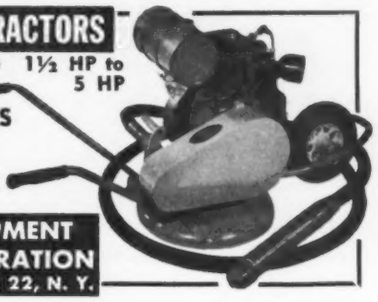
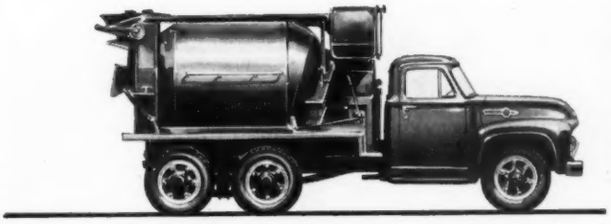

MARVEL EQUIPMENT CORPORATION
215-217 EAGLE ST. • B'KLYN 22, N. Y.

ANOTHER WAY YOU SAVE WITH FORD TRIPLE ECONOMY

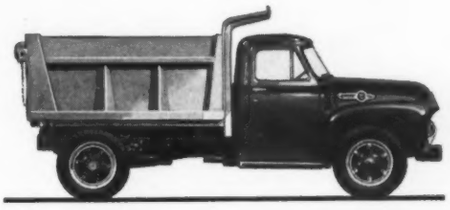


2 New Tandem Axle Big Jobs . . . up to 3800 lbs. more payload than other make 6-wheelers

Brand new Ford factory-built T-700 and T-800 six-wheelers rated for 27,000 lbs. and 40,000 lbs. GVW, up to 60,000 lbs. GCW. Powered by Low-Friction V-8's—138-h.p. *Power King* and 152-h.p. *Cargo King* (T-700), 170-h.p. *Cargo King* (T-800).

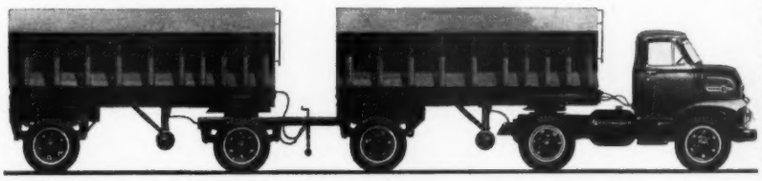
4 New Conventional Models . . . up to 27,000 lbs. GVW —55,000 lbs. GCW

New Ford Series F-700, F-750, F-800, F-900 offer body and payload capacities up to 20,117 lbs. Three new Low-Friction V-8's give you gas-saving power, from 138- to 170-h.p., concentrated in 256 to 317 cubic inches displacement.



4 New Cab Forwards . . . up to 2500 lbs. more payload

Ford's giant new Cab Forwards, C-700, C-750, C-800, C-900, haul 35-ft. trailers within the legal limit in all states. Rated up to 27,000 lbs. GVW, up to 55,000 lbs. GCW. C-900 handles up to 2500 lbs. more payload than other make cab forwards with 55,000 lbs. GCW.



'54 Fords go big on BIG JOBS!

Ten series in Ford's expanded line of new extra heavy duty trucks. New V-8 power up to 170-h.p.! New Master-Guide Power Steering! New money-saving capacities give you another way to save with Ford Triple Economy.

Now there's a Ford Truck to handle your toughest, heaviest hauling and do it with economy that's new to the extra-heavy-duty field.

New Low-Friction, Overhead-Valve V-8's deliver as much as 44% more power per cubic inch than other truck engines in their class. The fewer cubic inches an engine has, the less gas it usually needs. New Short-Stroke design cuts friction, increases engine life.

New *Master-Guide* Power Steering is standard on T-Series with *Cargo King* engines, optional at worthwhile extra cost on F-Series with *Cargo King* engines. It cuts steering effort up to 75%! Ford's new 3-man *Driverized* Cabs and controls provide comfort and driving ease to help the driver do a better job, faster and with less effort.

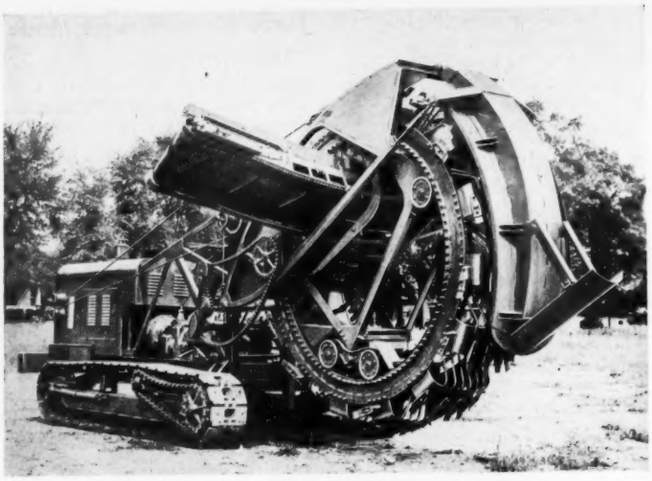
For new slants on heavy duty truck economy, call your Ford Dealer *today*, or write: Ford Division, Ford Motor Co., Dept. T-10, Box 658, Dearborn, Mich.

SAVE WITH ALL THREE!

1. New Gas-Saving Power
2. New Driver-Saving Ease
3. New Money-Saving Capacities

FORD TRIPLE ECONOMY TRUCKS

MORE TRUCK FOR YOUR MONEY!



This new Buckeye ditcher features independent wheel and travel speeds. ►

Wheel-Type Ditcher

■ A new pipeline and utility ditcher has been announced by Gar Wood Industries, Inc., 36253 Michigan Ave., Wayne, Mich. The Buckeye Model 315 is a heavy-duty wheel-type ditcher, designed to dig to a maximum depth of 6 feet. Width of cut varies from 24 to 40 inches in steps of 2 inches. The machine has eight digging speeds forward, ranging from 1.37 to 20.49 fpm. Independent wheel and crawler speeds give the machine operating flexibility.

The heavy-duty digging wheel comes equipped with 15 standard buckets, which are bolted on one-piece digging rims that permit variable bucket spacing. The rims are drilled so that 8, 10, 12, or 15 buckets can be used. Flat-bottom buckets are available as optional equipment. All buckets are equipped with quick-change rooter bits for quick replacement. Soil can be deposited on either side of the ditch by the shiftable conveyor. There are six conveyor speeds, ranging from 225 to 754 fpm.

A 76-hp diesel engine or an optional 80-hp gas engine powers the unit. Two types of clutches are available—either a Twin Disc fluid coupling used in conjunction with an over-center-type friction clutch, or a Twin Disc single-plate toggle-type clutch. Transmissions are sealed against dirt, and all gears run in oil or mesh with gears running in oil.

The machine's self-cleaning crawler tracks maintain a low ground-bearing pressure of 6 psi to permit the unit to operate over soft soil. Controls are grouped within easy reach of the operator. All components are easily accessible and may be removed for maintenance without disturbing other parts.

For further information write to the company, or use the Request Card at page 18. Circle No. 449.

Device Cures Cylinders Of Test Concrete

■ A new piece of equipment for the field curing of concrete test cylinders has been developed by E. W. Zimmerman, 228 N. LaSalle St., Chicago, Ill. This equipment, known as the Acme curing can, provides controlled humidity and temperature for the proper curing of cylinders, regardless of weather conditions.

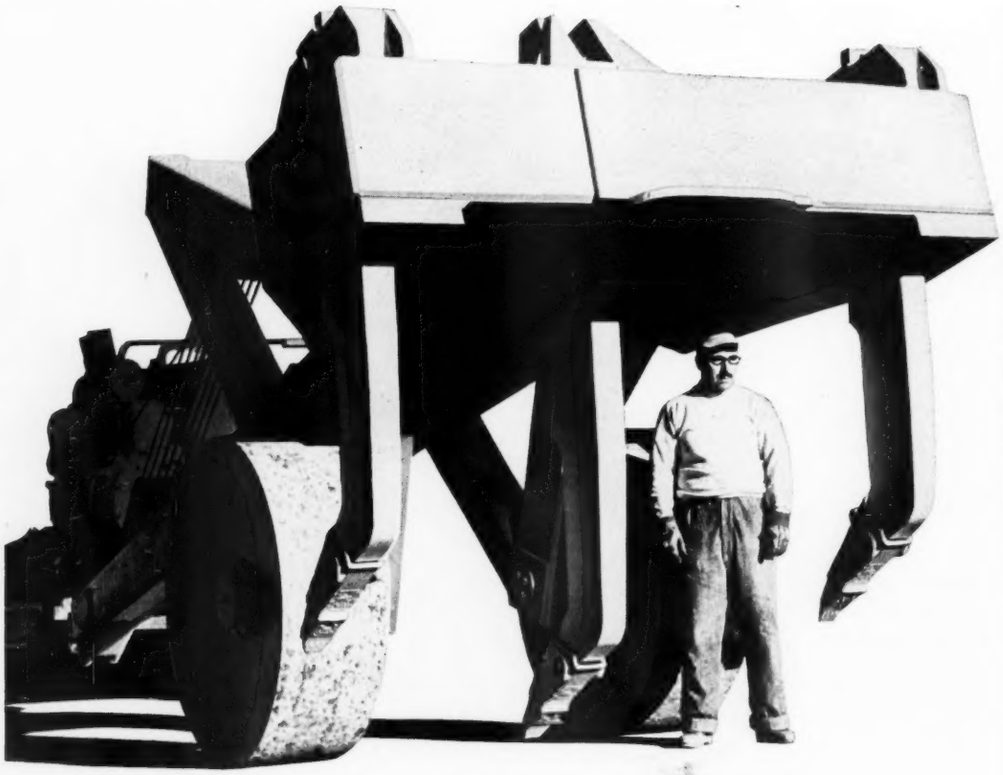
This specially designed container, with an insulating liner, operates on the principle of the thermos jug. For summer curing, it provides 100 per cent humidity at an evenly controlled temperature. For winter curing, the can helps protect the cylinder from the cold. The Acme curing can is sold in sets of six.

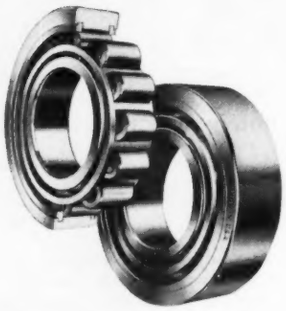
For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 395.

Strunk Expands Line

Master Mister power-spraying equipment formerly made by the Weller Mfg. Co., Bay Village, Ohio, will be marketed by the sprayer division of the Strunk Equipment Co., Coatesville, Pa., manufacturer of chain saws. Strunk, which recently purchased the Weller company, will handle sales of the equipment from its Coatesville plant.

Seventeen Tons of RIPPER!





. . . and Hyatt Roller Bearings keep it ready for the road!

In California, construction jobs are like the state: BIG! So Peterson Tractor & Equipment Company, of San Leandro, designed and built this gigantic, seventeen-ton road ripper—strong enough to withstand the pulling effort of *six* of the largest diesel tractors! Naturally, to protect their investment, the builders designed their giant with Hyatt Roller Bearings. Like equipment manufacturers in every industry, they know that Hyatts can be counted on to reduce friction, resist wear, and preserve alignment of moving parts.

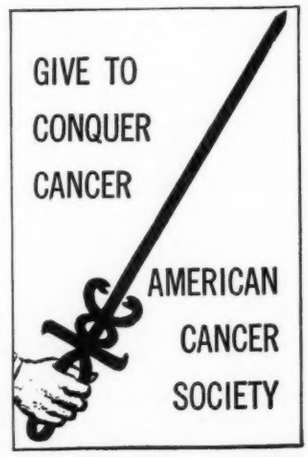
HYATT

STRAIGHT ROLLER BARREL ROLLER TAPER ROLLER

ROLLER BEARINGS

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

GIVE TO CONQUER CANCER



AMERICAN CANCER SOCIETY

Bituminous Mixing Unit

■ A new twin-shaft continuous-flow bituminous mixing unit which is self-contained and portable has been announced by the Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa. With a capacity rated up to approximately 40 tons per hour, depending on the mix, specified mixing time, and drying and feeding time, the new Cedarapids Model CM commercial mixer is designed for such jobs as patching roads and surfacing parking lots, driveways, and alleys.

Material is fed into the unit's Cedarapids 3612 package dryer from a two-compartment hopper equipped with a recriprocating feeder. Adjustable bin gates proportion aggregate according to specifications. An independent closed-bucket elevator delivers multiple hot-mix aggregate to the mixer. There, it is mixed to specifications with a constant flow of bitumen from the weight-calibrated metering pump on the mixing unit. The bucket elevator can also be arranged for cold-mix applications or for using a weight calibrated apron feeder on the mixing unit for single-aggregate hot-mix.

The finished product is delivered to trucks by a belt conveyor. The plant can also be mounted for stationary installation to discharge directly into trucks without the use of delivery conveyors. For a high-type mix, a gradation unit can be used, which will screen the aggregate into various sizes and provide for a steady flow of accurately proportioned aggregate to the mixing unit.

For further information write to the company, or use the Request Card at page 18. Circle No. 448.

Describe Overhead Loader

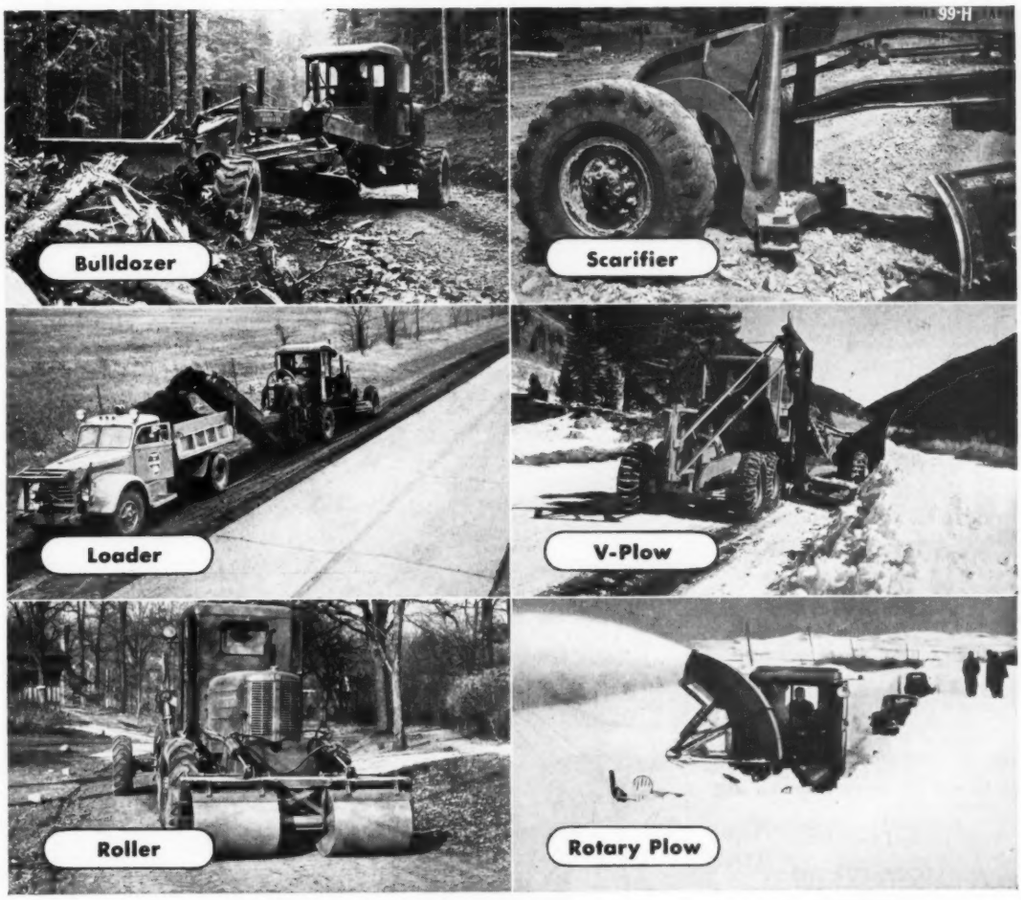
■ A catalog describing the Austin Overshot loader is announced by the Austin Division, Central Ohio Steel Products Co., Galion, Ohio. The Models 4-C and 6-C described are engineered for use with Caterpillar D4 and D6 tractors, respectively. The Model 4-C has a 1⅓-cubic-yard bucket capacity, and the Model 6-C holds 2 cubic yards. Both models are hydraulically operated.

The new folder is illustrated with action photos and line sketches. Mechanical features and operating principles are discussed with special emphasis on the Austin straight-in-line loading method.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 361.

◀ The new Cedarapids Model CM bituminous mixing plant in operation.

Only AUSTIN-WESTERN power graders can handle All these profit-making attachments



Thanks to exclusive All-Wheel Drive and All-Wheel Steer, Austin-Western Power Graders handle front and rear mounted attachments with maximum efficiency on jobs where ordinary graders—handicapped by a "dead" front end and lack of rear steer—would suffer through loss of traction or steering control.

An unrivaled line of attachments is available for Austin-Western graders—versatile tools for those extra jobs which mean extra profits—each attachment designed for a type of work frequently done by a separate machine. No ordinary grader can handle ALL of these attachments... no ordinary grader can use ANY attachment as efficiently. *Without* attachments, the Austin-Western Power Grader works more hours each year than conventional graders... *with attachments*, its uses are multiplied and its value increased beyond that of any other grader.

Austin-Western

Power Graders • Motor Sweepers
Road Rollers • Hydraulic Cranes

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Construction Equipment Division

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MAKE YOUR OWN ADJUSTABLE SCAFFOLDS
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AMIDON FITTINGS
Send for pictures and information
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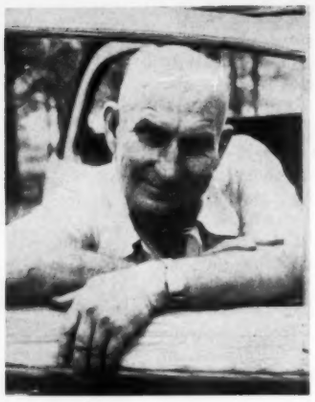
PORTRAIT IN PRINT

The Leveck 50-Year Success Plan

By R. D. ARNOLD



Don Leveck, owner and operator of J. H. Leveck & Sons.

ARKANSAS' OLDEST firm of general contractors is celebrating its 50th anniversary this year. But J. H. Leveck & Sons isn't taking much time out to reminisce. There are too many construction jobs under contract just now.

This Little Rock, Ark., firm can look back, though, on a half century's building activity which has left the Leveck mark on buildings and other projects throughout the state. And if the company has a byword, it is "caution", which owner Donald Leveck feels has helped the firm to weather two world wars, a depression, inflation, and local disasters such as floods.

Before World War II there was little industrial activity in agricultural Arkansas. Immediately after the war, the state's contracting firms were deluged with contracts, but large out-of-state firms soon moved in to get their share of the pie. Today, construction is a highly competitive business for companies like J. H. Leveck & Sons.

The firm has seen such business trends come and go in the 50 years since Don's father first hung out a shingle reading: J. H. Leveck, Building Contractor. And since 1920, when the founder took his two sons into partnership, Don has had an active part in guiding the business.

Don has owned and operated the Leveck firm since 1942, when his father retired and his younger brother, Herbert, went west where he is now in the construction business also. Don's wife, Ruth, is her husband's only partner and directs public relations for the company.

An active 58, Don is 5 feet 7 inches of initiative and ingenuity, quick temper, and friendliness. As far as other vital statistics go, he is of average build, blue-eyed, and—from testimony of his business associates and friends—has always been bald. Educated at Hendrix College, Conway, Ark., he also attended Arkansas Law School at night to learn interpretation of the legal aspects of building contracts.

Trained in every phase of the business from operation of the commonest hand tool to running of huge pieces of machinery, Don turns his spare time to designing new products for use in construction. He has designed and built a trench hoe, a concrete bucket, a 45-foot boom, and a ½-yard clamshell bucket. His ingenuity was illustrated recently when he devised an economical signal system for directing traffic over a one-way bridge lane.

Signal Device

In order to permit one-way traffic while his firm was paving a bridge, Don rigged up a system of stop lights operated by a synchronous motor. For 45 seconds the light at one end of the bridge is red, while at the other end it is green. For 10 seconds, while the bridge is cleared, both lights are red, and then the arrangement is reversed. The con-

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CROSBY CLIPS
your
"SYMBOL OF SAFETY"

When you see the Crosby Clip's Red "U" Bolt, you know the "job is safe!" Made of drop-forged steel and hot-dip galvanized, there's an *extra margin of safety built in!* Insist on genuine Crosby Clips—available in all sizes.

Wherever you are, there's a Crosby Clip distributor.

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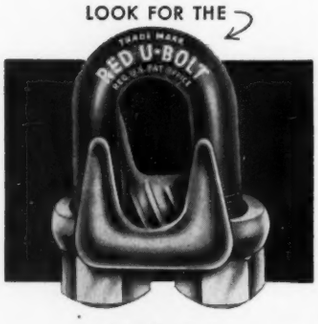

Crosby Products
Division of
American Hoist & Derrick Co.
St. Paul 1 • Minnesota

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NEW CARVER
Contractor Pumps

All the important features contractors have wanted for years are built into this new great line of CARVER Self-Priming Pumps . . . truly in every way "The Contractor's Pump."

Lightning fast prime, really dependable performance and easy portability make them the standouts in the field.

Carver makes them all: 4000 G.P.H. to 250,000 G.P.H. Also diaphragm pumps.
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HORIZONTAL & VERTICAL ROTARY DRILLS

Drill holes 2" to 12" diameter

Depths to 300'

Drill Wells, shot holes, under streets or highways; thru earth, sandstone, limestone or shale in hours, not days

Advise us your problem
Write for Catalog

CENTRAL MINE EQUIPMENT COMPANY
6200 N. Broadway
St. Louis, Missouri

Policy of caution and ingenuity has paid off for this pioneer Arkansas contracting company

Mr. and Mrs. Donald Leveck in their Little Rock, Ark., home. The house and much of the furniture were built by Don and a few friends.

tractor feels he has saved $1,000 with the device, which eliminates the need for two flagmen to direct traffic.

Even today, as owner of the firm, Don may be found pinch-hitting at repairing machines, running a hoist, or any one of dozens of other specialized jobs. He has tool-working equipment at his home and spends many hours experimenting with equipment ideas.

When his employees were called into service in 1942 and building materials became hard to get, Don answered an urgent government call for the use of home machinery. In his workshop, he made thousands of loading devices for detonators being manufactured at a nearby defense plant.

The wartime curtailment of commercial building activity, together with numerous consumer product shortages, seemed to bring out the best of Don's inventive talent. A pianist and organist, he built an electronic organ for his home when electrical machines were almost impossible to get. He built a basement chicken brooder. Together with Mrs. Leveck, he entertained hundreds of servicemen at the Leveck home during the war, and the menu invariably included vegetables from the terraced victory garden out

(Concluded on next page)

Check your Tackle Blocks for best service. Worn sheave grooves, bearings and pins are expensive.

LOWER HANDLING COSTS

- Blocks correctly designed and engineered for your specific operation save money.

Our engineering services are available for your specialized needs.

Over a quarter century of service.

Send for our complete catalog today. MADESCO TACKLE BLOCK CO. EASTON, PA.

MADESCO BLOCKS

HAE-M592—2-54

"Torqmatic Drives Cut Costs"

Heading down a rock-strewn grade with a 40-ton payload at Gavins Point Dam, this bottom-dump "Euc" easily takes the rough going with Allison's TORQMATIC DRIVE transmitting engine power.

Western Contracting Corporation started saving money when the firm put a fleet of TORQMATIC-equipped 27-yard Euclid bottom-dumps to work at Gavins Point Dam. Company officials report:

"Clutch repairs are eliminated in the TORQMATIC-equipped units because there's no clutch pedal for drivers to push. Clutch life averages 90 days in a fleet of direct-drive trucks also working for Western on this job.

"Used to lose as many as 4 drive lines a week with drivers *manually* coordinating engine and drive line on the direct-drive units . . . *never lost a drive line* with TORQMATIC DRIVES."

On TORQMATIC-equipped trucks, drivers quick-shift at full throttle—have only 3 forward speeds (instead of the usual 7 or 10) to handle all loads and grades. The converter-transmission team eliminates gearshift guess and gearbox clash. TORQMATIC DRIVES have such an excellent operating record on this job that the operator intends to specify them in future equipment orders.

If you're one of the men who's changing the face of the earth, do it better and at less cost with Allison TORQMATIC DRIVES in your units. For more information, ask your equipment dealer-manufacturer or write:

Allison Division of General Motors
Box 894C, Indianapolis 6, Indiana

ALLISON TORQMATIC DRIVES

Unbeatable Team for Maximum Operating Economy

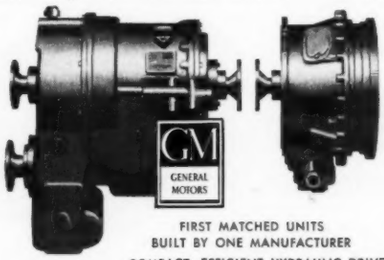
Reduces maintenance costs by absorbing shock—eliminates engine lugging—prolongs equipment life.

Holds power to load at all times—no clutch pedal to push—no gearshift guess.

Quick-Shifts at full throttle with finger-tip hydraulic control.

Only torque converter-transmission team designed to work as a unit and built by one manufacturer.

Cuts driver training costs.



FIRST MATCHED UNITS BUILT BY ONE MANUFACTURER

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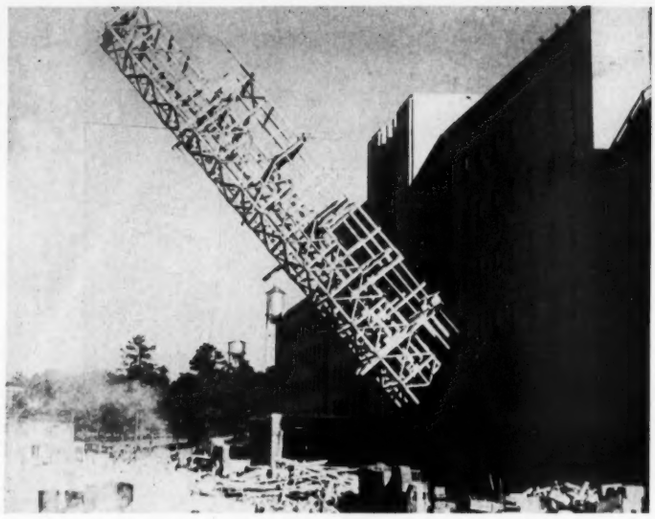


A construction elevator tower used by J. H. Leveck & Sons in building Nyberg Hall at the State Tuberculosis Sanitorium, Booneville, Ark., is knocked down to save the time and expense involved in tearing it down piece by piece.

(Continued from preceding page)

back, chickens from the basement brooder, and music from the home-built organ.

Even this contractor's home was a wartime project. It is a solar-heated structure on a hillside site, with an 18 x 34-foot concrete swimming pool in the garden. Throughout the house are features designed by Don himself and constructed with the aid of a few friends. The pickled oak furniture and oak stairway nosings were built by the contractor with his home lathe and band saw. The Acousti-Celotex ceilings and door closers were remnants from building jobs. The ammonia-refrigeration unit was adapted for air conditioning. The swimming pool was built first so that the forms could be used again in building the house.

Credit to Father

In reviewing the history of the firm, Don Leveck unfailingly credits his father with keeping the firm on a sound financial footing. J. H. Leveck instilled in his son a respect for the same business principles he himself had always followed. Today, as Arkansas' oldest living contractor in point of both service and age, the elder Leveck is affectionately known in the trade as "Pops".

The Leveck organization includes, besides Don and General Superintendent Roy C. Bridges, a full-time office man, a full-time maintenance man, and additional employees as they are needed. Individual projects sometimes call for hundreds of workers, not to mention assistant superintendents, draftsmen, estimators, and clerical workers.

Among half a dozen projects for which J. H. Leveck & Sons holds contracts at present are two bridge repaving jobs. The state has launched a program to replace old asphalt-covered-oak bridge floors with welded steel grids poured full of lightweight concrete. Leveck, first in the state to construct the grid jobs, has two such projects under way now.

Equipment Changes

In this 50th year of his firm's existence, Don Leveck can look back almost the entire span to the days when he carried water for his father's laborers to drink. He has watched modern earth-moving machinery replace the mule team, pick, and shovel as standard equipment, and has seen construction methods change radically from those first employed by his father as a pioneer contractor.

But although he has grown up with the industry and brought his company into an age of spirited competition, the Arkansas contractor prefers to think of his firm as a conservative one. He is content with his share of jobs and declares that occasional slack periods add zest to living, besides building momentum for the frenzied pace which the contractor learns to accept as normal.

All of which might seem like a pretty good recipe for a half century's success in the construction business. Certainly caution, careful training, and ingenuity have paid off for Don Leveck. THE END

"Twin" loads 16 bank yards in less than a minute..*with help of TIMKEN® bearings*

THIS big Euclid Twin-Power Scraper is working on a mountainous highway relocation job in North Carolina. Self-loading in a downhill cut, it consistently loads 16 bank yards in less than a minute!

One reason for this excellent performance: the "Twin" has 20 Timken® bearings in wheels and other key points. These bearings reduce friction, make the giant machine operate more smoothly and easily.

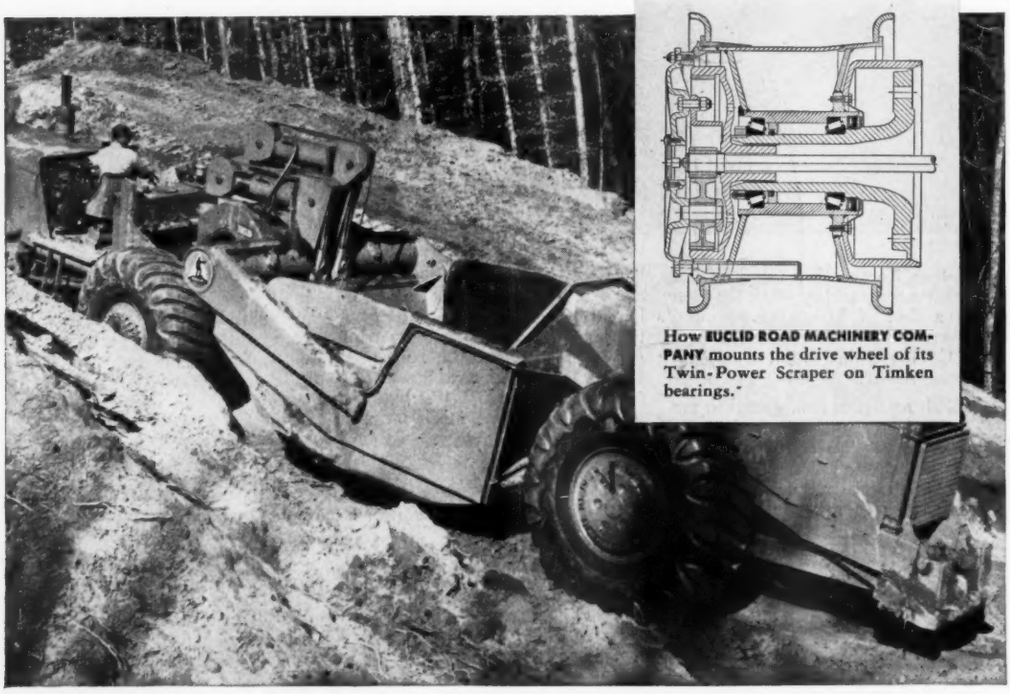
The diagram below shows how the wheels are mounted. With the "Twin" loaded, these wheel bearings take tremendous loads which makes Timken bearings ideal for the job. They carry the load on a full line contact between their rollers and races and this gives them inherently high capacity.

When the "Twin" rambles over uneven terrain, these wheel bearings must take heavy sidewise "thrust" loads in addition to the customary radial loads. That's another big advantage of Timken bearings: their tapered design enables them to take both radial and thrust loads in any combination so that no extra thrust devices are needed.

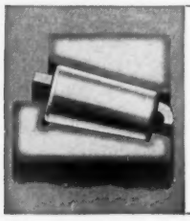
On tough applications like this, the superior quality of Timken bearings really pays off. For example, in order to get the best steel possible we make our own. No other bearing company in the U. S. A. does.

When you buy or build construction machinery, make sure the bearings are stamped with the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How EUCLID ROAD MACHINERY COMPANY mounts the drive wheel of its Twin-Power Scraper on Timken bearings.



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The Dixie crane Model DC-33 is available mounted on a half-track or on a truck. It is also offered without a truck for mounting on the customer's vehicle.

Morris Named by Soiltest

The Chicago firm of Soiltest, Inc., has made M. D. Morris its representative in New York and the surrounding area. A civil engineer, Mr. Morris will handle sales engineering for the complete line of field and laboratory apparatus for engineering tests of soils, concrete, and bituminous materials. His headquarters is at 545 Fifth Ave., New York.

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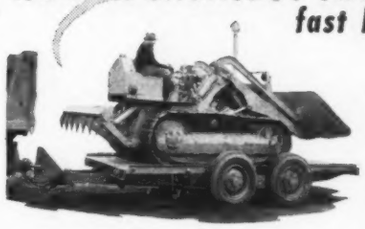

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Model "BT-10" 10 TON

EQUIPMENT INCLUDED: platform, four 8.25x20x12 ply tires, heavy duty electric brakes with automatic electric break-away switch and controls, tires, lights, reflectors and safety chains.

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research engineers

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Excavator-Crane Is Mobile and Versatile

■ An excavator-crane in the ⅜-yard class is offered by the Freshwater-Smith Machine Co., South Dixie Highway, Fort Pierce, Fla. The Dixie crane Model DC33 is supplied with a mounting to suit the customer's job. It is available either on a half-track or on a suitable pneumatic-tired truck; or for mounting on the customer's vehicle.

The Model DC33 converts to crane, clamshell, or dragline use. Its chief operation features are hydraulic controls, independent boom hoist, and hook rollers. An International Model U-164 four-cycle 31.5-hp gasoline engine or a Chrysler Model IND-6A engine powers the machine.

The boom length of this unit is 25 feet. Maximum rear lifting capacity with outriggers is 5 tons at a radius of 10 feet. Capacity to the side is 7,650 pounds at this radius. At a 25-foot radius, lifting capacities are 5,350 pounds to the rear and 2,150 pounds for side lifting.

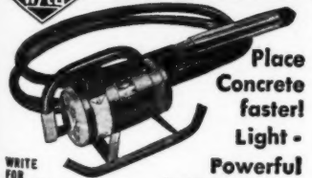
Without outriggers, the crane will lift 7,100 pounds to the rear and 5,800 pounds to the side at a 10-foot radius. These ratings are 2,650 and 1,850 pounds respectively at a 25-foot radius. These capacities are figured for the unit mounted on a half-track or on a 2½-ton standard truck.

For further information write to the company, or use the Request Card at page 18. Circle No. 429.

Pro Joins Air Placement

George M. Pro has been named a partner in Air Placement Equipment Co., Kansas City, Mo. An engineer, Mr. Pro will be in charge of design and development of new products for the firm, which now manufactures Bondactor concrete gunning equipment and the Mix-Elvator.

WYCO 2 H.P. UNIVERSAL ELECTRIC MOTOR VIBRATOR



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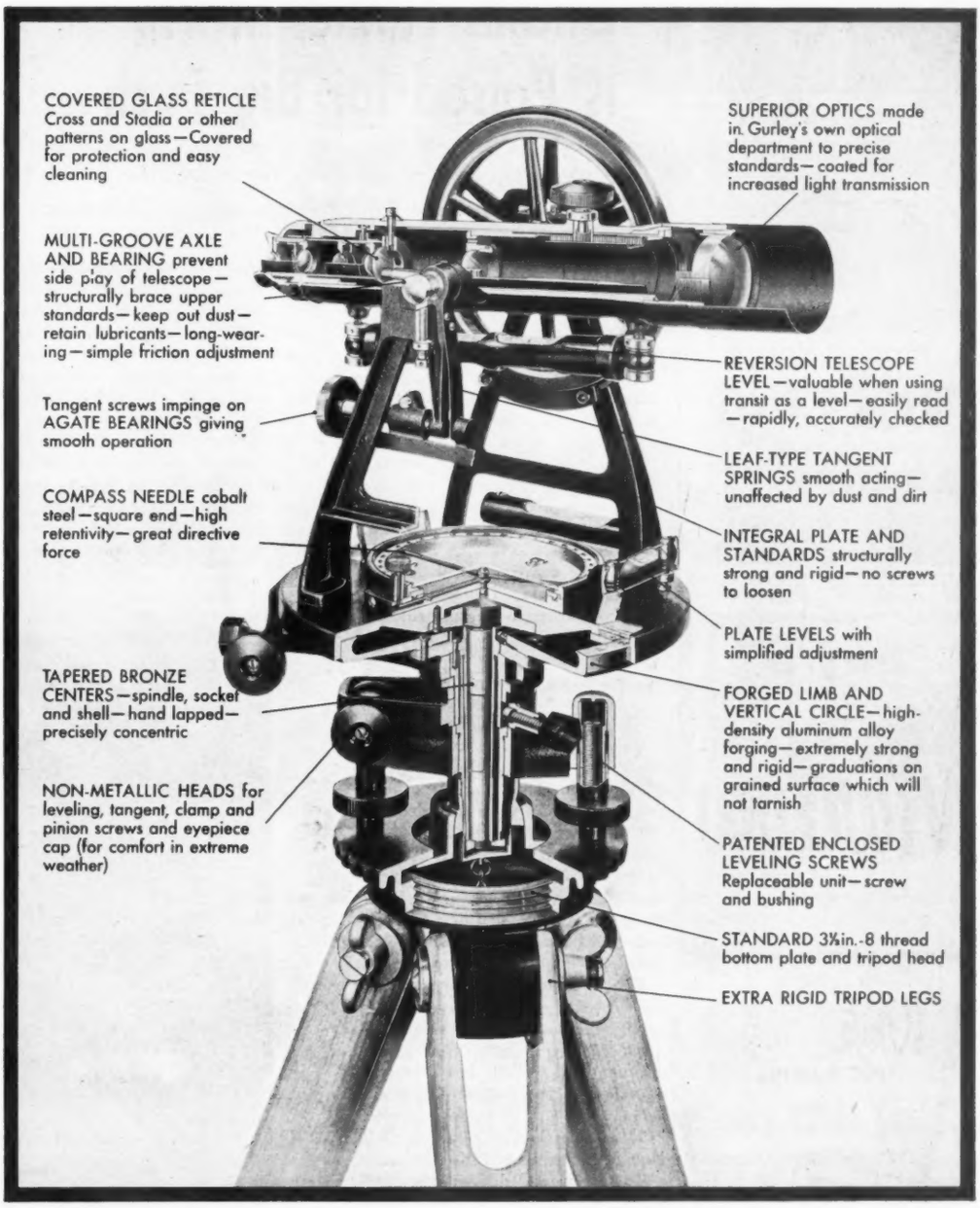
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EXTRA RIGID TRIPOD LEGS

The Gurley Precise Transit

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GURLEY

At the bottom of the New Jersey shaft, muck is loaded into 4-yard boxes by a Unit shovel with ½-yard bucket. *C&E Staff Photos*

Lincoln Tunnel Shield Is Poised for Big Push

Huge steel cylinder will drive the third tube under the Hudson from New Jersey to Manhattan

THE HUGE steel shield that will drive the third tube of the Lincoln Tunnel under the Hudson River is now being assembled at the bottom of a vertical rock shaft at the river's edge in Weehawken, N. J. Some time next month, it will begin shoving itself through more than a mile of rock and silt to the New York shaft.

Work on the $100,000,000 tube began nearly two years ago, after the Port of New York Authority awarded a $2,547,000 contract to Gull Contracting Co., Flushing, L. I., calling for the construction of the New York land shaft. The 85-foot-deep shaft will be used during construction for the delivery of materials into the tube. Later, it will become the foundation for the ventilation building on the New York side of the river. A 360-foot land section of the tunnel, constructed by the open cut method, is also in the contract.

About the same time, two other major contracts were awarded. A $10,621,000 contract went to Bethlehem Steel Co., Bethlehem, Pa., covering 46,275 tons of cast-steel and cast-iron tunnel segments. Pittsburgh Screw & Bolt Corp. received a $492,000 contract for 298,000 high-tensile bolts and 596,000 washers.

The two-lane third tube will be approximately parallel to and south of the existing tubes between midtown Manhattan and Weehawken. Its total length will be 7,944 feet, portal to portal. External tunnel diameter of the underwater carrier is 31 feet, roadway width is 21½ feet, and headroom, 13 feet.

The exit portal in New Jersey will have a common plaza with the existing tubes. In New York, the third tube will extend to a new portal adjacent to and south of the existing south portal.

Port Authority plans also call for the widening of the toll plaza in New Jersey to provide five additional toll lanes and a new center ramp. The approach loop structure will be widened by one westbound lane running to the top of Kings Bluff in Weehawken.

The tube design is similar to that of the existing tubes. Ventilation will be handled by 24 fans in two new buildings. Continuous fluorescent tubing will provide light.

The section of the tunnel between the two shafts will require about 30,000 cast-steel and iron segments, 35,000 cubic yards of concrete, and 2,600,000 pieces of 4¼-inch ceramic tile squares.

New Jersey Shaft

In May of last year, work began on the New Jersey shaft. A joint venture of Walsh Construction Co., B. Perini & Sons, Inc., and Peter F. Connolly Co. was awarded a $509,000 contract to excavate the 55-foot-deep shaft at the base of Kings Bluff in Weehawken. The contract also includes the erection of a temporary steel truss bridge over the N. J. Junction Railroad to provide access to the shaft.

The joint-venture contractors first had to remove about 13,000 cubic yards of rock from the face of Kings Bluff before starting on the shaft. Near the top of the steep bluff, a considerable amount of concrete work was required to seal off areas of loose rock and eliminate the hazard of falling rock. The face of the bluff was also gunited to help keep the rocks in place.

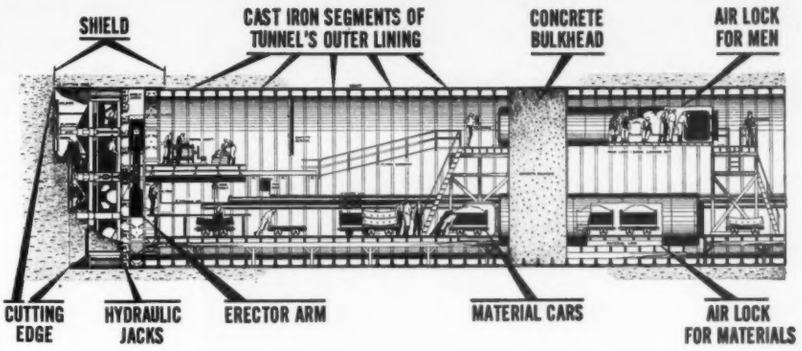
The shaft, 110 feet long and 61 feet wide, is located 22 feet south of the existing ventilation building, and is sandwiched between the rock bluff and a railroad.

Excavating the 55-foot-deep hole followed typical drilling, blasting, and mucking procedures. Three Gardner-Denver wagon drills and the usual jackhammers were used to drill 10-foot holes on 3-foot centers. Air was supplied by two Joy 600-cfm compressors. Bits were Timken carbide. Dust from the drilling was removed by a dust collector supplied by the Air Compressor & Pump Corp.

Holes were cleaned by an air jet

A Manitowoc crane with 80-foot boom raises muck and dumps it into a waiting railroad car.

Shown in cross section is the work setup as the third tube is driven under the Hudson River to New York.



and loaded with sticks of Du Pont 40 per cent dynamite. Shots were made whenever feasible.

The blasted rock was removed by an efficient combination consisting of a Unit shovel and a Manitowoc 35-ton crane. The lightweight shovel with ½-yard bucket worked at the bottom of the shaft, loading material into 4-yard boxes which were hoisted to the surface by the Manitowoc crane and emptied into side-dump railroad cars. The rock was hauled away by the New York Central Railroad and used along the roadbed between Weehawken and Kingston.

As the shaft was deepened, Bethlehem expansion bolts 6 feet long were anchored into the walls at intervals to stabilize the rock.

Walsh-Perini-Connolly averaged about 140 yards of excavation per 8-hour day.

Biggest Contract

When the shaft work was well underway, the Port Authority approved the award of a $17,260,000 contract, the largest single award of the project, to a joint venture of Mason & Hanger Co., Inc., The Arthur A. Johnson Corp., and MacLean-Grove & Co., Inc. The joint bid covers construction of 6,258 feet of the 7,944-foot tunnel.

Mason-Johnson-MacLean moved in late in 1953 and started setting up a huge plant on the Jersey side between the railroad and the water's edge. The million-dollar installation is housed in a group of Luria prefabricated metal buildings concentrated into a 2-acre plot. Buildings up to 120 feet long and 60 feet wide are being used to house offices, material, change house, machinery, and compressors. The engineer's office is of steel frame construction and the medical building is of wood frame construction.

Shield Method

The third tube will be driven by one shield from the base of the New Jersey shaft to the base of the New York shaft since Port Authority engineers decided that one shield operating from a single compressor plant would be more economical than two shields with separate plants.

For the first several hundred feet, the rock in front of the shield will be blasted, drawn into the tunnel, and taken up through the shaft. The shield will then emerge from the rock and enter the soft silty material which underlies the Hudson River and the adjacent shoreline.

The shield itself, made by the American Locomotive Co., Schenectady, N. Y., is in the shape of a horizontal cylinder, 20 feet long and 31 feet in diameter. It consists of a steel-plate outer lining and an interval series of horizontal and vertical steel members. Earth and rock are taken into the tunnel through openings in the front frame. Before the shield is driven through silt, these openings are sealed off and two muck doors are installed. On the outer circumference of the shield's forward edge are cast-steel cutting edges. Inside the shield are the twenty-eight 200-ton hydraulic

(Continued on next page)

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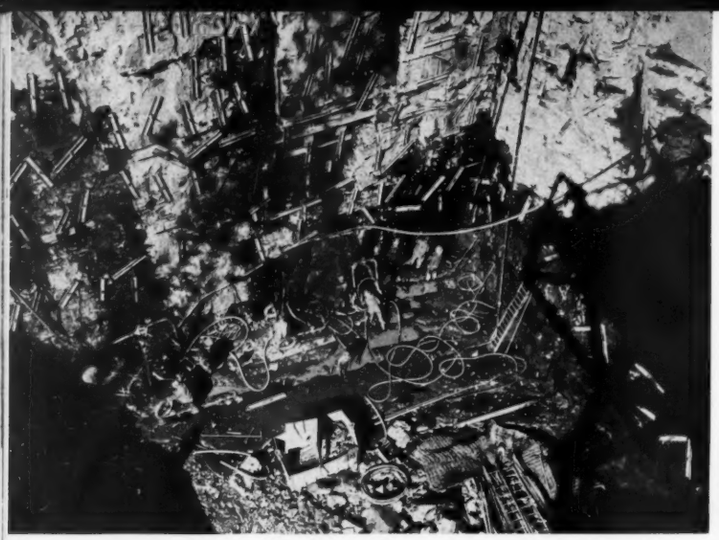
FACTORIES IN RIDGEWOOD, N. J., MORTON GROVE, ILL., LONGVIEW, TEXAS



Using Gardner-Denver wagon drills, workmen drill 10-foot blast holes in the bottom of the shaft. Bethlehem anchor bolts with special steel ties stabilize the vertical rock walls.
C. & E. Photo

(Continued from preceding page)

jacks that shove the shield forward.

As the shield is pushed forward, cast-iron rings will be erected inside the tail to form the permanent lining of the tunnel. Each ring has an outer diameter of 31 feet, and is made up of fourteen segments and a key. Each segment is 7 feet long and 32 inches wide. High-tensile bolts will hold the rings together.

One ring will be constructed after each shove. To erect a ring, the 3,200-pound segments are thrust into place by a huge erector arm which is attached to a diaphragm at the rear of the shield and pivots around the diameter of the tunnel. Cast-steel, rather than cast-iron segments, will be used at points of high stress, such as areas where the tunnel passes from rock to earth.

Working in Air

The silt is in a semifluid state which will create an external pressure varying with its depth below the river and with the consistency of the surrounding material. To offset this pressure, compressed air will be induced into the tube. A concrete bulkhead will be installed inside the cast-iron lining and be pierced by four air locks. Men and material will pass in and out of the forward working chamber without loss of air pressure.

Mason-Johnson-MacLean have set up a huge compressor plant to handle the high air, which powers pneumatic tools, and the low air, which maintains the pressure inside the shield. High air will be supplied by a Joy 550-cfm, a Joy 750-cfm, and two Chicago-Pneumatic 1,600-cfm compressors. A total of 23,000 cfm of low air will be available from four Ingersoll-Rand 5,748-cfm compressors. All of the compressors are bolted to heavy concrete foundations supported on steel H-piles.

Public Service will supply electric power to the job from three separate circuits.

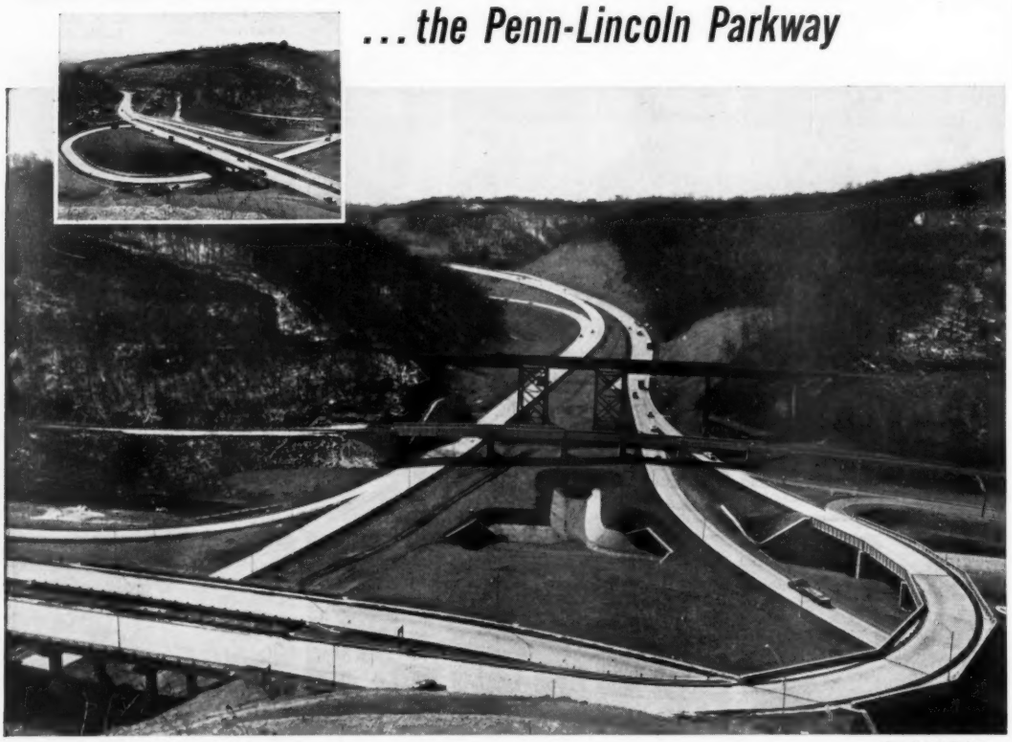
Pushing the Shield

As the shield is shoved ahead, controlled amounts of silt will be allowed to ooze into the tunnel. Sandhogs will cut up the plastic material and place it along the bottom of the tunnel so that the weight of the silt will tend to offset the buoyancy of the incomplete tube.

Beneath the river, as much as 80 per cent of the silt displaced by the tube will be pushed aside. The remaining 20 per cent will be taken in and deposited as ballast. The tendency of the shield to push aside

Smooth...from overpass to underpass

...the Penn-Lincoln Parkway



Penn-Lincoln Parkway

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Without obligation, please send me complete data and prices on Flexcell Bituminous Fiber Expansion Joint Filler.

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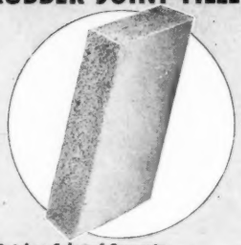
Servicised Cementone Sponge

RUBBER JOINT FILLER



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most of the surrounding medium is expected to present problems on the New Jersey side, where the tube underlies a railroad and several buildings. To prevent any heaving action which might disturb these foundations, 100 per cent of the material displaced will be taken into the tunnel and removed in mine cars through the bulkhead locks. Grouting and gravel packing will be done immediately after the driving operation in this area to offset settlement damage to overlying structures.

Construction Shaft

When the shield first starts out, it will be serviced from the ventilation shaft. But as it nears the water's edge, it will be sealed temporarily, a construction shaft will be sunk down behind it to the top of the tube, and several segments will be removed. A hoisting rig will then be installed inside the new shaft. In addition, all air and utility lines, which will have previously run over the temporary bridge and down into the tunnel through the ventilation shaft, will be routed directly down into the new construction shaft. A concrete bulkhead will then be constructed east of the shaft to maintain the pressure in the forward working chamber. With this completed, the shield will resume its long push across the river.

At the center of the Hudson, the top of the tube will be about 25 feet below the riverbed. As the shield reaches the New York shoreline, the big cylinder must push itself through hundreds of feet of disturbed riverbed material and filled-in ground. Dredges will remove some unstable material above the line of the tunnel. This material will be replaced with a clay blanket that will hold the air pressure in the tunnel. At the shoreline, the shield will again enter rock, and another bulkhead will be installed. The shield will continue through the rock to the New York shaft. There, a removable circular plate will receive the shield, and a special chamber will maintain pressure so that the tunnel can be sealed in place before the compressed air is shut off. After the pressure is removed, the muck will be taken out of the bottom of the tube. An inner lining of 14 inches of concrete will then be poured throughout the tunnel.

While sandhogs push the shield across the river, other crews will be driving the 830-foot rock tunnel from the base of the New Jersey ventilation shaft to the new portal. This work will follow conventional drilling, blasting, and mucking procedures. A Bucyrus-Erie snub-nosed electric shovel will handle the mucking. This rock work will be speeded to free the shaft for construction of the ventilation building.

Engineers expect to complete the shield driving in about 16 months. The target date for the opening of the tube is early 1957.

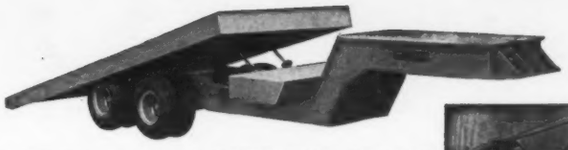
Personnel

John M. Kyle is chief engineer for the Port of New York Authority, and Paul E. Blume is project engineer. H. George Decancq is overall engineer on construction, and Henry A. Druding is resident engineer for the tube project. Company project managers are Marcel MacLean, Mason - Johnson - MacLean; Harvey Dugan, Walsh-Perini-Connolly; and Charles Lose, Gull Contracting Co., Inc. THE END

American Chain & Cable Names Sales Manager

Sales manager for the new Atlanta sales district of the wire rope divisions of American Chain & Cable Co., Inc., Bridgeport, Conn., is Nelson G. Griffith, who will make his headquarters at 1401 Howell Mill Road, N. W., Atlanta, Ga.

Mr. Griffith, who has been sales representative for the divisions' New York district, will be in charge of sales in Georgia, Florida, Alabama, Mississippi, Tennessee, and South Carolina.



MODEL GPX-D — Tandem axle. Drop or flat deck. Cap. 16 through 35 tons.

MODEL PS — Single axle, spring mounted platform or float.

MODEL SP—Jack over axle model.

YOU'LL SAVE TIME AND EQUIPMENT . . . with A "TRANSPORT TRAILER"

14 thru 22-ton capacities . . .

Gooseneck type tilting platform cargo carrier equipped with two double-acting hydraulic cylinders cushion trailer platform when titled, with or without load. Saves time—saves equipment — one man operation. Exclusive "TRANSPORT" tandem axle assembly gives both lengthwise and crosswise oscillation.

For Added Service . . .

Single or dual axle "TRANSPORT" front dollies convert semis to full trailers easily and quickly.

WRITE FOR COMPLETE INFORMATION

TRANSPORT TT TRAILERS INC.

CEDAR RAPIDS IOWA, U.S.A.

Digs Tank Bed in Hard Rock

IN DALLAS, TEXAS, a formation of hard white rock was encountered on the site of a 2,000,000 gallon prestressed concrete water tank, one of the largest of this type in the U.S. The rock bed was so hard it posed a real excavation problem for Whittle Construction Co.

Whittle whipped the problem by using a CLEVELAND Model 140 Trencher to cut closely spaced shallow trenches across the rock formation. This excavated a considerable volume of rock and enabled the dragline bucket to bite into the weakened ridges of rock between the trenches. As each layer of rock was cleared away the CLEVELAND dug the next level and prepared it for haul out by the dragline.

This job is only one of hundreds of unusual applications that have proved time and again over 30 years the outstanding toughness and versatility of CLEVELANDS—and their ability to dig *more trench in more places at less cost* for you.

Get the Full Story on **CLEVELANDS** from Your Local Distributor

THE CLEVELAND TRENCHER CO.

"Pioneer of the Modern Trencher"

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

NOW SHOWING

"WHAT YOU SHOULD KNOW ABOUT DIESEL ENGINES"

NEW P&H COLOR SOUND FILM

It's an all-new sound-slide film . . . that provides clear, concise answers to "What you should know about Diesel engines." Give it a showing, and it will give you a better A to Z understanding of the diesel engine — how it operates; how it compares with gasoline engines; two versus four cycle diesels; why P&H Diesels perform better on tough jobs; how they save money on both operating and maintenance costs

Plan a review of this educational and entertaining color sound-slide film. Ask your P&H dealer about it . . . or write us for details.

P&H

DIESEL ENGINE DIVISION

HARNISCHFEGER CORPORATION CRYSTAL LAKE, ILLINOIS

the P&H Line

Plymouth diesel locomotives, made in 3 to 70-ton models, are offered with a hydraulic torque-converter transmission.

Diesel Locomotives Have Torque Converters

■ Hydraulic torque converter transmissions are standard equipment on many diesel locomotives made by the Plymouth Locomotive Works, Plymouth, Ohio. In addition to models with gasoline and diesel-Torqomotive drives, the Plymouth line includes units with diesel-mechanical drives and others with diesel-electric drives. Models range in size and weight from 3 to 70 tons.

The chief advantage of the torque converter drive is the application at any instant of the most effective ratio for existing conditions of input torque and load. The use of the hydraulic mechanism eliminates vibration and shock loads from the engine and results in a smooth drive. The possibility of stalling the engine through overload is also eliminated. In addition, torque converters have few wearing parts, and the normal wear on axles, gears, and chains is reduced because of the shock-absorbing features of the converter.

The hydraulic torque converter is mounted directly to the engine bell housing and is equipped with a disconnect clutch. The torque converter is connected to the transmission by means of a flexible coupling and provides an infinite number of ratios including zero.

For further information write to the company, or use the Request Card at page 18. Circle No. 424.

Use of Optical Squares Explained in Booklet

■ Optical squares the size of a plumb bob turn a true right angle by means of pentagonal prisms. Since pentagonal prisms have the property of bending the line of sight exactly 90 degrees no matter how the instrument is turned in a horizontal plane, the optical squares can be held by hand and still turn accurate right angles. They need not be set up on a tripod and cannot get out of adjustment.

Contractors use these devices for laying out and checking buildings, concrete forms, ditches, pole lines, and boundaries, as well as in working with cross sections and topographic maps. Optical squares will also do rough leveling work. An illustrated booklet available gives details on how the devices are used and explains their working principle.

To obtain this literature write to the Henry Wild Surveying Instrument Co., Main and Covert Streets, Port Washington, N. Y., or use the Request Card at page 18. Circle No. 430.

Osgood Acquires Stock Of General Excavator

The Osgood Co., Marion, Ohio, manufacturer of power cranes and excavators, has purchased all the capital stock of The General Excavator Co., also of Marion. At the same time, Edgar W. Barnhart, formerly vice president and general manager of General Excavator, was elected vice president and secretary of the Osgood organization. Sales and service policies are unaffected.

Cedarapids Built by IOWA UNITIZED PLANT

HERE'S the way to outproduce your competition, handle *any* aggregate producing job that comes along . . . and do it at the low production costs that mean a tidy profit on every job.

The Cedarapids Unitized Plant shown above produced four products at a time . . . lime dust from 1/8″ down, 3/4″ Class A road rock, 3/8″ minus material and 3/8″ to 3/4″ aggregate . . . at a rate of 210 tons per hour!

To meet specifications for other jobs, the basic primary crushing, scalping, secondary crushing and bin units can be combined in dozens of different ways to produce any size products in volumes up to 250 tons per hour or more in quarry operations. And you get real economy in operating and maintenance costs.

Your Cedarapids distributor can give you *all* the reasons why Unitized Plants are your best bet for beating competition. *Call on him today.*

USE THESE 4 BASIC UNITS IN ANY COMBINATION

PORTABLE PRIMARY CRUSHER reduces raw material to a size readily handled by the scalping unit or secondary crushing unit. Single and Twin Jaw Crusher or Double Impeller Impact Breaker units available in a wide range of sizes.

SCALPING UNITS, consisting of a single or twin jaw crusher and horizontal scalping screen, remove excess fines and dirt, and perform a crushing operation to reduce the circulating load for the secondary crushing unit. Choice of sizes.

SECONDARY CRUSHING UNITS are complete crushing and screening plants designed for high volume production of fine crushed products. Three types of crushers are available . . . roll, twin jaw or hammermill . . . to suit your job requirements.

BIN UNITS may be portable storage and loading bins, as shown above, or wet or dry screening, storage and loading units.

IOWA MANUFACTURING COMPANY Cedar Rapids, Iowa, U. S. A.

Master Bituminous Mixing Plant

Vibratory Soil Compactor

Motorized Head Pulley

Model G-60—6000-lb. Bituminous Mixing Plant

FOUNDATION CONSTRUCTION
CAISSONS
SHAFTS
DRILLED AND UNDERREAMED
PIERS
SPECIAL DRILLING PROBLEMS

Wire or phone for a quotation on your next foundation job — ANYWHERE IN THE WORLD

McKINNEY DRILLING COMPANY
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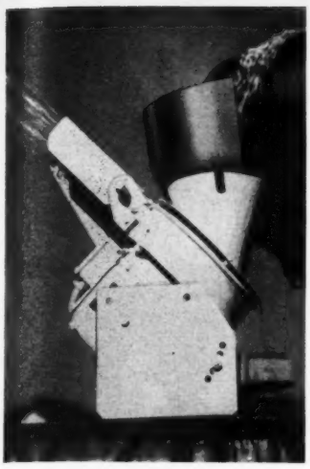


The Model M Pettibone Speedpiler receives the discharge of a conveyor and throws it into a pile.

Sand and Stone Piler

■ Another new sand and stone piling machine has been added to the line made by the Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Ill. The new beltless Model M Pettibone Speedpiler takes sand and stone discharge from belt conveyors and throws the material into piles or bins at a minimum rate of 40 tons per hour. When used with a washing plant, the machine also removes excess water from the material.

Suspended under the discharge end of a conveyor, the new piling machine eliminates the need for costly conveyor extensions usually required for comparable piling. The machine may be mounted on a platform or equipped with pneumatic tires. Weighing approximately 550 pounds, it can be moved about quickly and easily.

The trajectory is regulated by an adjustable discharge chute. The receiving hopper will accommodate the discharge from conveyor belts up to 30 inches wide. Special hoppers and replaceable wear liners are available.

The Model M Pettibone Speedpiler is direct-motor-driven with a 3-hp motor and is available for 50 or 60-cycle, two or three-phase, 220, 380, 440, or 550-volt ac current. Standard equipment includes a starter with push buttons and overload protection. A large capacity piling machine is also available.

For further information write to the company, or use the Request Card at page 18. Circle No. 475.

Brochure on Truck Crane

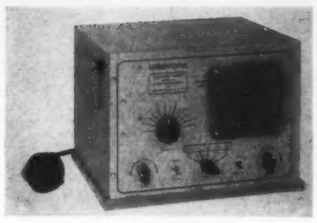
■ A crane that installs on almost any truck 2½ tons or larger is described in literature from the Pitman Mfg. Co., 300 W. 79th Terrace, Kansas City, Mo. The Pitman Model 80 crane has a capacity up to 4 tons on a 25-foot boom and up to 3 tons on a 37-foot boom. Both booms are hinged and can be folded or unfolded quickly. Additional boom lengths of 48 and 59 feet are also available.

The crane is shown loading and unloading pipe, handling a ½-yard concrete bucket, handling and setting structural steel, and doing other construction work. Complete specifications are listed.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 476.

New Radio-Telephone

■ New marine radio-telephone equipment has been announced by the Bludworth Marine Co., 92 Gold St., New York 38, N. Y. The Model BRT-1025 has a built-in power supply and features a 4-channel crystal-controlled 18-watt transmitter, in accordance with latest FCC ratings. It includes a tuning broadcast receiver.



The equipment operates on 6 or 12 volts dc. Its daytime range is 35 to 50 miles, and its range at night is 125 to 150 miles.

For further information write to the company, or use the Request Card at page 18. Circle No. 342.

Weather Forecasting

■ Long-range weather forecast service is offered by Weather Trends, Inc., 550 Fifth Ave., New York 36, N. Y. The long-range forecasts may include detailed information for a specific city or location. The service also makes available a general long-range forecast covering the entire nation.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 343.

Mountain moved to make 5000′ breakwater for west-coast harbor

To better protect the harbor at Ensenada, one of Mexico's few Pacific-coast ports, a fleet of modern earth-movers is rushing completion of a giant breakwater. This structure of blasted rock will extend 5,000 ft. into the sea, average 130 ft. wide (water is over 50 ft. deep in many spots).

Owned by Clark and Mansilla Co., Ensenada, 6 LeTourneau-Westinghouse Rear-Dump haulers are handling 85% of the yardage. Several times a day, sandstone rock is blasted from a mountain near the water's edge. This jagged material is shovel-loaded into the Rear-Dumps, hauled to the end of the growing breakwater, and dumped into the sea.

Drive over rocky fill, dump safely

The haul road is naturally very rough and bumpy because it passes over previous fill that is 80% blasted rock. Giant tires, 4-wheel air brakes, and independent positive power steer make it safe for the Rear-Dumps to travel this long "finger" far out into the ocean. Loaded with 12 yds. of sandstone, the units with their big rubber tires compact the fill during normal cycles.

The 6 machines work two 8½-hour shifts daily, 6 days per week. Each delivers 60 pay yds. per 50-minute hour, traveling over 5200-ft. cycles. Individual trips average 7.7 minutes (including 2.4 minutes to load).

In spite of delays for blasting, and difficulties in shovel-loading large and awkwardly-shaped rock, LeTourneau-Westinghouse dependability and speed help keep work on schedule. "Our LeTourneau-Westinghouse haulers," say owners Clark and Mansilla, "are doing an excellent job. We are amazed at how well they stand up under the rough conditions."

Pleased with service

Capt. Ignacio de la Vega, in charge of all operations, says that he is pleased with the equipment and with the service and cooperation he gets from his LeTourneau-Westinghouse Distributor. Write us for more information or an on-the-job demonstration. No obligation, of course.

Tournatractor—Trademark RT-493-D-bw

When bank consists of big, jagged pieces of sandstone like this, competitive rear-dump trucks, assigned 15% of total yardage, stand idle. Some of the rocks handled by the LeTourneau-Westinghouse Rear-Dumps measured 5 x 6 x 12 ft. and weighed over 30 tons.

A touch of an electric switch on operator's panel dumps rocky fill into the ocean 10 ft. below the breakwater. Independent brakes, front and rear, allow operator to back safely to the edge, lock rear wheels, roll front wheels back to dump clear.

Clark & Mansilla's Tournatractor handles both clean-up work on the breakwater and haul road maintenance. Four-wheel drive on big low-pressure tires puts plenty of power and traction behind the blade to shove huge rocks like this into the bay.

LeTourneau-Westinghouse Company | PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Trial Run—Coal is carried along the Pennsylvania Railroad's new $10 million ore pier in the Delaware River near Philadelphia on a B. F. Goodrich steel cable reinforced rubber belt in a preliminary test. Four cranes, extending 72 feet on each side of the pier, will unload iron ore from four ships simultaneously.

Asphalt Production—Material is kept flowing through hoppers and Barber-Greene conveyors in this part of the storage and direct car-loading facilities of the Uvalde Rock Asphalt Co. near Blewett, Texas. The firm mines 750,000 tons of material annually, most of which is used for highway work in the area.

Cross Rolling*? NOT when you use a Buffalo-Springfield 3-axle tandem!

YOU CAN MEET DENSITY AND SMOOTHNESS REQUIREMENTS IN FEWER PASSES WITHOUT CROSS ROLLING, CUT JOB TIME.

*** Rolling in one direction with conventional 2-axle tandems often fails to give proper levelling results. It can leave waves or bumps that have to be ironed-out by later cross-rolling or rolling on the diagonal. All too often, material *has already set* by the time cross-rolling is done. This can cause serious internal damage to the material, can make it deteriorate quickly under traffic. Most important of all, it costs you *extra job time.***

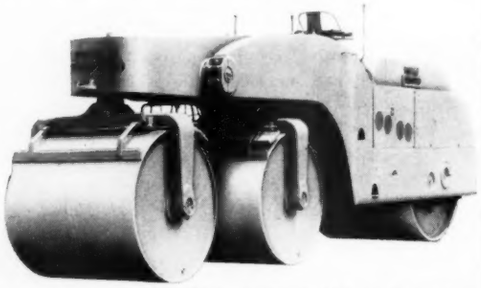
Walking Beam 3-Axle Tandems with Compaction Control completely eliminate cross-rolling, the *internal* damage to material it causes, and the extra job time it requires! You *finish* rolling material while it is pliant and workable. You can meet density and smoothness requirements in considerably less rolling time than required with 2-axle tandems!

Facts from the field:

Contractors report averaging more than 60% higher tonnage compacted per day with 3-axle tandems than with 2-axle tandems doing similar work. Published records show 3-axle surface roughness indices are as much as 50% lower than state averages. And many states specify fewer rollers, less rolling time when you use Buffalo-Springfield 3-Axle Tandems!

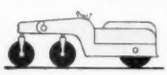
Consider what this means to you in dollars and cents. Fewer passes, no cross-rolling whatsoever, fewer rollers to operate and maintain, lower capital investment. Jobs getting done faster and better than ever before. A real chance to cut costs and make money on those jobs you really want!
Write for Bulletin S-62-53.

There's a Buffalo-Springfield Distributor conveniently located to serve you.

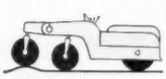


Buffalo-Springfield 3-axle tandem

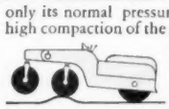
This is Walking Beam Compaction Control:



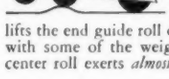
1. Both guide rolls are suspended from a single rotating beam. When the beam is "semi-locked," the end guide roll can pivot above but not below its normal position.



2. When the first guide roll encounters a high spot in the fresh material, the Walking Beam rotates to permit the first guide roll to pass over the hump exerting only its normal pressure. This "prepares" the material for the high compaction of the center guide roll.



3. Then the center guide roll rises on the hump. The "semi-locked" Walking Beam causes the entire guide end of the roller to rise with the center roll. This lifts the end guide roll off the ground, transfers its weight, along with some of the weight of the *drive* roll. At this instant, the center roll exerts *almost 3 times its normal compaction.*



4. The drive roll exerts its normal compaction as it passes over. The Walking Beam can be used unlocked for rolling vertical curves and warped surfaces. Can also be used fully locked, if desired.

See your distributor for complete information or write —

Buffalo-Springfield Roller Co.

BUFFALO SPRINGFIELD
THE STANDARD OF COMPARISON
SPRINGFIELD, OHIO

THE LEADER IN ROAD ROLLER DESIGN AND MANUFACTURE.

Highway Department Personnel Changes

Continuing a reorganization begun last year, the Connecticut State Highway Department has established a unified engineering force with Chief Engineer Warren M. Creamer in full charge and responsible to the highway commissioner.

All operations of the technical staff, the materials laboratory, and the four districts will be coordinated by Walter T. Schuler, who has been named acting assistant chief engineer (field). Traffic, planning, and design functions will be coordinated by the assistant chief engineer (office). Ernest T. Perkins, formerly director of traffic-planning-design, has been transferred to this post.

Along with these changes, a Bureau of Contracts has been established within the office of the chief engineer. The titles of coordinating district engineer and director of traffic-planning-design have been cancelled.

Others affected by the changes are Robert G. Mitchell, who has been named acting engineer of traffic-planning-design, and Howard S. Ives, who has been transferred to the post of engineer of surveys and plans.

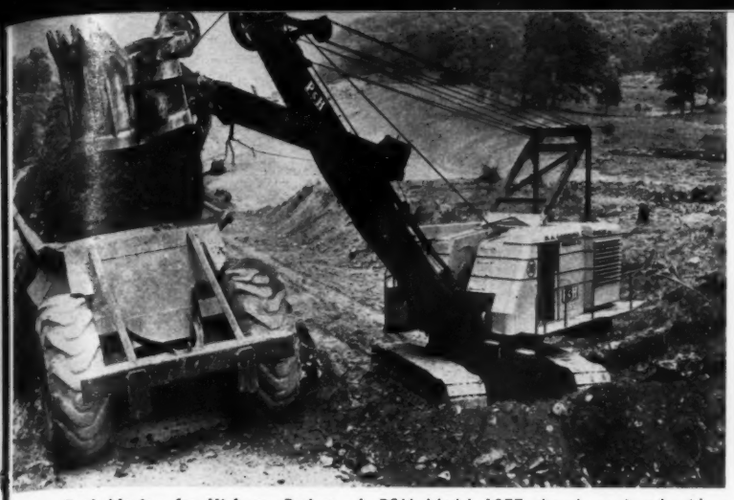
Asphalt Assn. Is Formed

Organized for the purpose of improving the structural and economic advantages of asphalt mixtures for highways, The Maryland Asphalt Association, Inc., headed by H. Guy Campbell, was recently formed.

Walter R. Macatee is the association's executive secretary and consulting engineer, with headquarters in the Equitable Bldg., Calvert and Fayette Sts., Baltimore 2, Md.

Vulcan Tools
— FOR —
Rock Drills, Pavement Breakers and Clay Diggers

Vulcan Tool Manufacturing Co.
35-43 Liberty Street, Quincy 69, Mass.
Branch Offices and Warehouse Stock.
57 Leonard St. 34 No. Clinton St.
New York 13, N. Y. Chicago 6, Ill.
Send for catalog or see your local distributor.



Earth-Moving for Highway Project—A P&H Model 1055 shovel, equipped with a 3½-cubic-yard bucket, loads an earth-mover with dirt as it works on a road-construction project being carried out near Providence, R. I. The contractor on this highway work was the M. A. Gammino Construction Co. of Providence.

New Application—A section of aluminum "sandwich" curtain wall is placed on the U. S. Air Force Heavy Press Plant at Alcoa's Cleveland, Ohio, works. The wall built with two fabricated sheets separated by a 1-inch layer of glass fiber has twice the insulating value of 12 inches of masonry.

Work Begins on Extension Of Pennsylvania Turnpike

With Governor John S. Fine on hand to turn the first spadeful of soil, ground was broken little more than a month ago for the 110-mile northeastern extension of the Pennsylvania Turnpike. The ceremonies, attended by a number of state and county officials, were held on Route 940, approximately midway between Blakeslee Corners and White Haven.

The new link will be the first north-south leg of the superhighway. It will begin near Plymouth Meeting on the Delaware River extension and run through the state's coal and resort region to a terminus in Scranton. Eventually, the road will be extended to the New York state line.

Expected to produce enough revenue to be self-supporting, the road will provide the northeastern section of the state with road facilities which will benefit the area's industries and resorts. The road will also serve to reduce heavy through traffic on present free highways passing near towns and cities which will be served by the turnpike.

At present, the state's turnpike system totals 327 miles and extends from the Ohio state line in the west to Valley Forge in the east. Completion of the Delaware River extension this October will add 33 miles to the system to give Pennsylvania a 360-mile superhighway network. The northeast extension, scheduled for completion next year, will give the turpike system 470 miles of road.

Last year's traffic toll of deaths and injuries was the heaviest in history. Speeding on U. S. streets and highways last year killed 13,870 men, women, and children.

TWIN PRIME PUMPS

...Better performance ...Lower cost

DUAL VOLUTES, fast priming, non-clogging portable, long lasting centrifugal pumps. Distributors—write for attractive proposition.

Write for circular

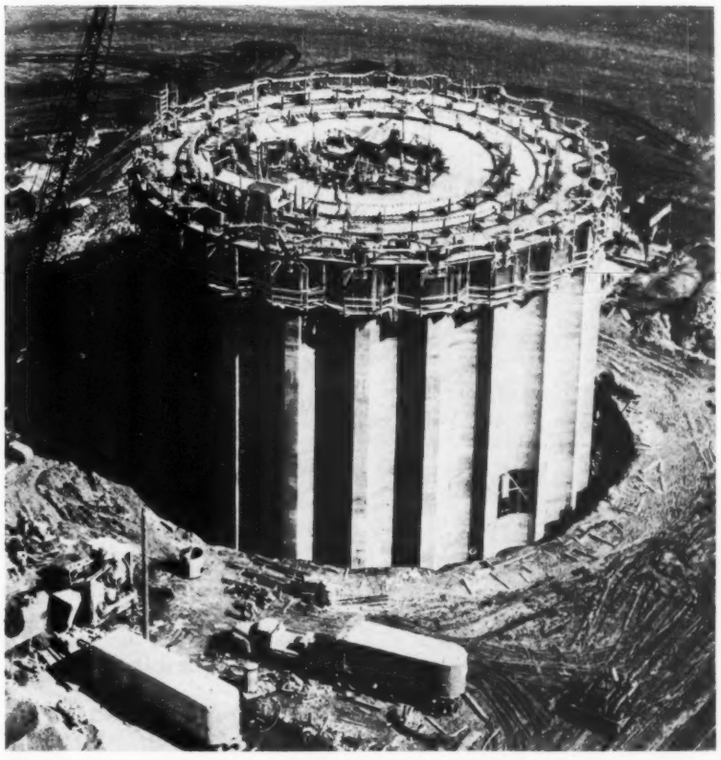
OHLER MACHINERY CO.

WATERLOO 5 IOWA

CITY OF DALLAS WATER TOWER

constructed with slipform method using

"CONCRETOR" HYDRAULIC JACKS



Four cylindrical walls poured simultaneously with 127 Jacks.

Outermost diameter 100 feet.

Note efficient platform working area.

Everything Required for Raising of Forms Was Provided By Us

Jacks

Yokes

Jack Rods

Pumps and Supervising Engineers

SYNCHRONIZED JACKING AT ITS BEST

CONTROLLED CENTRALLY OR INDIVIDUALLY

Whittle Construction Company, Dallas, Texas using Concretor Jacks and Slipform Equipment for first time raised above base of tower 83 feet with acknowledged savings in jacking cost.

Write our Engineering Department for full particulars on the Concretor system and rental plan available.

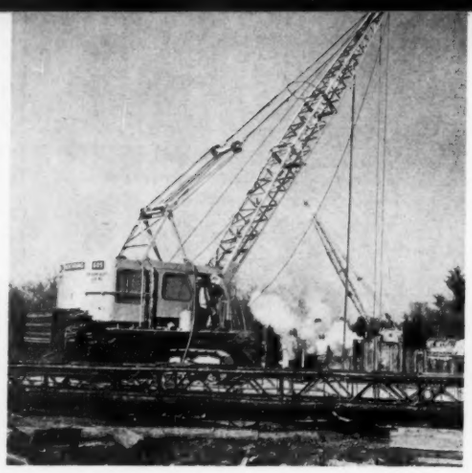
B. M. HEEDE, INC.

80 BROAD STREET • NEW YORK 4, N. Y.

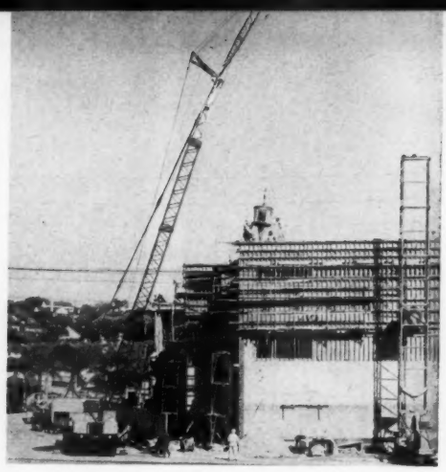
CONCRETOR SILOS Reg. Trade Mark

U. S. & FGN Patents

CONSTRUCTION CAMERA



Driving Sheet Piling—Constructing a pier cofferdam, this Koehring 605 crane with McKiernan-Terry 9B3 hammer works on a new bridge over the Algiers Navigation Canal south of New Orleans, La.



Concrete Pour—With 80 feet of boom and a 30-foot tip extension, a Lorain MC-524 hoists concrete to a pour on a building being constructed for the General Telephone Co. in California.

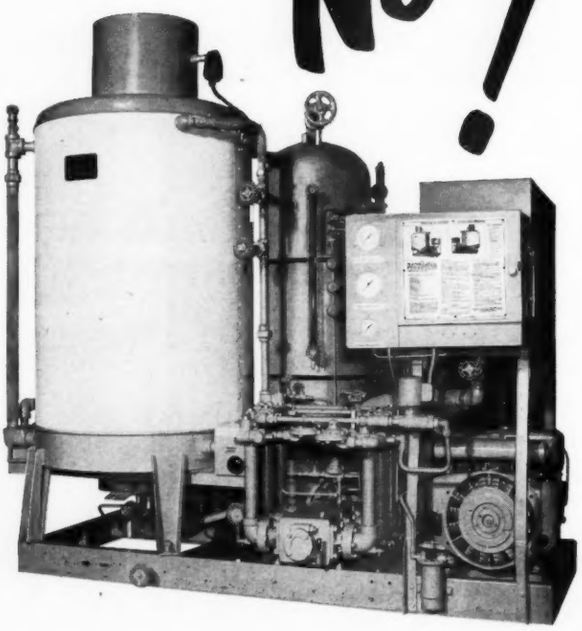
Plant Foundation—A. Bentley & Sons, Toledo, Ohio, uses Gar Wood excavator with foundation-borer attachments to dig footing holes for the Toledo Edison Co.'s new $29 million power plant.

McKiernan-Clayton

STEAM GENERATOR

Reduces Pile Hammer Operating Costs from Coast to Coast!

New!



The McKiernan-Clayton Steam Generator is built expressly for McKiernan-Terry Corporation by the Clayton Manufacturing Company.

The new McKiernan-Clayton Steam Generator, built expressly to generate steam for pile hammers, is proving its worth across the country. Mounted on the tail of a Diesel crane, on a trailer, or on skids, the unit contributes to building a compact and economical pile-driving rig.

How the McKiernan-Clayton Steam Generator saves pile-driving dollars!

- *Inexpensive to mount:* no larger than a medium-sized air compressor.
- *Inexpensive to lift, tow or carry:* light in weight and completely self-contained on its steel base frame.
- *Inexpensive to operate:* quickly started, full-pressure steam in 3 minutes, fuel burned only for steam required by pile hammer.
- *Inexpensive to fire:* high efficiency, forced recirculation water system and continuous coil assure high heat transfer, giving greatest value for each fuel dollar spent.
- *Inexpensive to maintain:* high-strength steel construction, no side-wall refractory brick, packless pump, shock resistant.

For additional information write for Bulletin 63.

McKIERNAN-TERRY CORPORATION
19 PARK ROW, NEW YORK 38, NEW YORK
Manufacturers of Pile Hammers and Extractors, Coal and Ore Unloaders and Bridges, Grab Buckets and Special Machinery.

MK898

Initial Work Starts On Mackinac Bridge

Preliminary substructure work on what is reportedly the most costly bridge project ever to be undertaken has been started by Merritt-Chapman & Scott Corp., New York, N. Y. The $80,000,000 structure will span the Straits of Mackinac, linking the two peninsulas which form the northern boundaries of Lake Michigan.

Approximately 70,000 tons of steel will be required for the bridge, which will have a 3,800-foot center span, 552-foot towers, and a 48-foot roadway. A total of 30 truss spans will connect the suspension bridge to shore approaches at either end. The minimum clear height at the center of the span will be 148 feet to allow passage of the largest Great Lakes vessels.

The total length of the bridge and its immediate approaches will be 5 miles, while the structure itself will be about 4 miles long. Its continuous length over water—17,918 feet—will be greater than that of the

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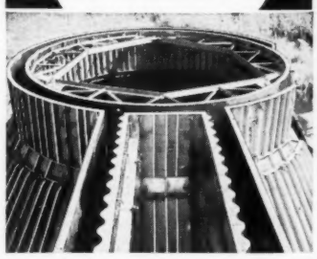

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metal forms for concrete construction

Spillway Excavation—A Caterpillar DW20 tractor with No. 20 wagon, working on the Hoover Dam spillway near Columbus, Ohio, heads toward the dump with a load of shale. H. N. Rodgers & Son, Memphis, Tenn., was the earthwork subcontractor for this part of the job on the earth and concrete dam.

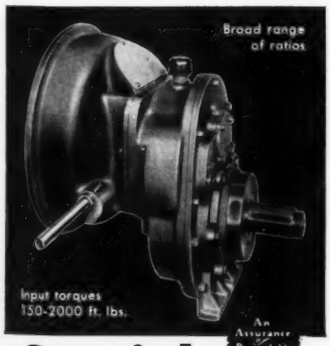
Combats Weed Problem—Adapted to slope banks and clean weeds from irrigation ditches, this Caterpillar No. 112 motor grader works along a levee road in the Lower Tule River Irrigation District near Porterville, Calif. The job is done by a modified shoulder finisher, and the slope of the blade is regulated by the operator.

San Francisco-Oakland Bay Bridge, which is split into two crossings by an island.

Two cables, each 24¼ inches in diameter, will carry the four-lane structure. The steel towers will be of the conventional flexible type with fixed bases. The two shafts of each cellular-type tower will be connected by horizontal struts of open-trussed construction.

Construction of the bridge is expected to require the work of more than 1,000 men. Merritt-Chapman & Scott's $26,000,000 contract for the substructure called for work to begin immediately, while a $44,500,000 contract awarded to United States Steel's American Bridge Division provides for work on the superstructure beginning next year. The bridge is expected to be completed and ready for traffic by November 1, 1957.

The contracts were awarded by the Mackinac Bridge Authority, Lansing, Mich., which is constructing the bridge with funds realized from a sale of nearly $100,000,000 worth of revenue bonds.



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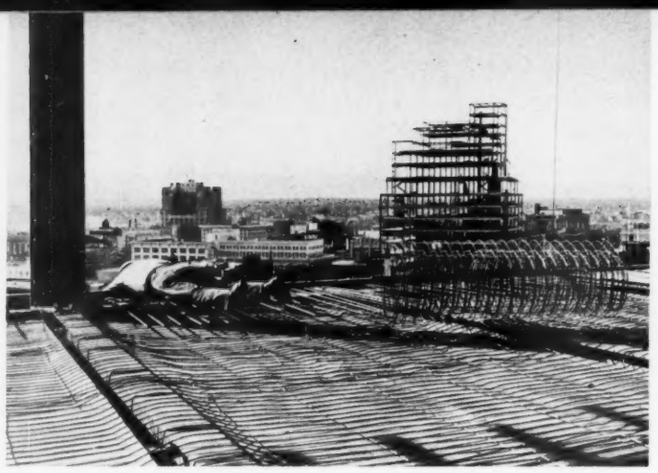
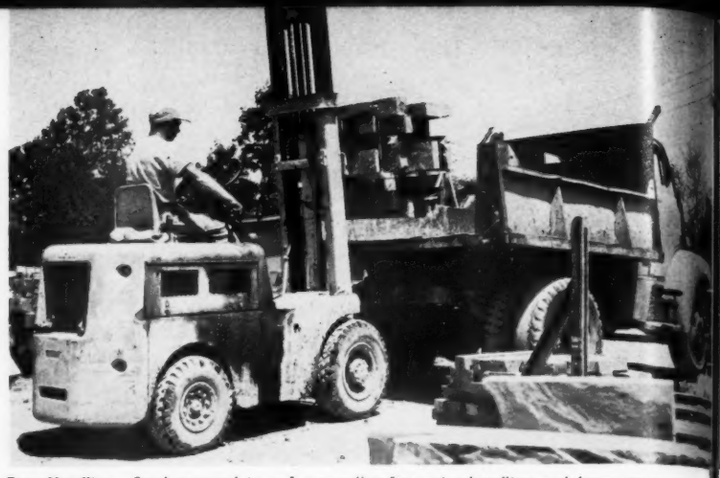
CONSTRUCTION CAMERA



Floor Construction—A workman makes a final adjustment before pouring starts on the 16th floor of Denver's Mile High Center. Floor slabs of lightweight expanded shale aggregate, reinforced with draped welded wire fabric, will save about 30 per cent of floor dead load. In the background, framework rises for the Denver Club.



Easy Handling—Steel-strapped in a 1-ton pallet for easier handling and lower cost, a package of Lenroc stone from the Finger Lakes Stone Quarry, Ithaca, N. Y., is loaded on a waiting truck by a Clark fork-lift truck. Fork-lifts, entering the package, are also used to rehandle the stone at its destination.

Proper Placement Promotes Profits

There are no delays on this job—no waiting for concrete or tie up of crews when the concrete placing job is equipped with a Gar-Bro concrete bucket, floor hopper and concrete carts. They are basic tools of the industry. On this municipal stadium job 420 cu. yds. were placed in 10 hours.

When bucket and crane could not reach the center of a reservoir floor, a fleet of Power-carts shuttled the concrete from a Gar-Bro Portable Hopper to the floor slab forms.

Contractor saves money by discarding fixed tremie stations and using movable Gar-Bro elephant trunks to chute concrete deep into wall forms. Gar-Bro 1-yd. buckets and collection hoppers were used.

40 ft. under water, concrete was placed with a special 4 cu. yd. Gar-Bro bucket converted by addition of a crown top. Gate was air-operated by remote control from barge.

Write for 60-page Concrete Handling Manual

Includes useful tables, references, correct and incorrect methods, unusual jobs solved and other data.

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Peoria, Illinois, 1600 North Adams

New Orleans Bridge Is Approved by Army

Construction of a 2-mile-long bridge across the Mississippi River at New Orleans—under consideration for more than twenty-five years—moved closer to reality after the Department of the Army approved revised plans for the structure. The span will be built by the Mississippi River Bridge Authority at a cost of $54,081,000.

In submitting the application for army approval, the authority pointed out that natural boundaries will force any further expansion of the city to take place across the river. The approved bridge plans call for a cantilever center span 1,575.33 feet long, which will have a 1,400-foot clear width for navigation and be 150 feet above high water. One of the bridge piers will be located in the river 555 feet from the left bank.

A previous application for a 1,400-foot span, having a 1,241-foot clear width for navigation and a clearance of 135 feet above high water, was rejected by the army in March, 1953, on the ground that such a structure would be a navigational hazard. The army later approved plans for a 1,800-foot span farther downstream. Difficulties in design and construction made it impossible to finance this structure, however, and modifications were made in the plans for the original bridge.

Studies for the crossing have concentrated on a cantilever-type span because the area's alluvial and highly compressible soil does not lend itself to the construction of a suspension bridge which would meet the required dimensions.

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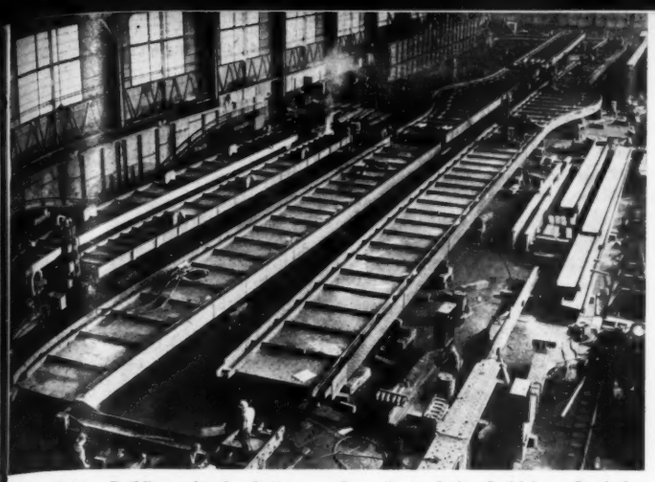

Bridge Building—At the Pottstown, Pa., plant of the Bethlehem Steel Co., final work is done on giant haunch girders being fabricated for the Garden State Parkway span over the Raritan River in New Jersey. The first two girders shipped to the erection site weighed more than 200 tons each and measured 263 feet in length. Girders were lifted into place by a derrick traveler with 115-foot boom, which operated from the bridge deck, and by a derrick with 85-foot boom which operated from a 120-foot tower of a tower-derrick boat. The river was closed to normal traffic during erection. *(See story in Column 1 below)*

Haunch Girders Are Set For N. J. Parkway Span

STEELWORK on the Raritan River Bridge, the largest of the 282 spans on New Jersey's $285,000,000 Garden State Parkway, was completed last month as the last of three pairs of haunch girders was set in place.

Each of the first two giant girders, set in place April 2, weighed 200 tons and measured more than 263 feet in length. One end of a girder was hoisted by a derrick traveler, equipped with a 115-foot boom, which operated from the bridge deck. The other end was lifted by a derrick, having 85 feet of boom, which stood on the 120-foot tower of a tower-derrick boat. Since anchor lines of the derrick boat blocked the channel, the river was closed to normal traffic for 12 hours by the New York district office of the U. S. Army Corps of Engineers while the girders were taken from a carfloat, lifted 135 feet into the air, and set in place on the high-level span.

Until floor framing is erected, the girders will be kept stable by specially designed lateral stiffening trusses bolted to their top flange. Fabricated in the Pottstown, Pa., works of Bethlehem Steel Co., the girders were first shipped in sections to Jersey City on railroad flatcars. Assembled on a carfloat, they were then towed to the bridge site by tugs.

Measuring 20 feet at the deepest part of the haunch, the girders were too large to ship full depth. Sections had a horizontal splice and were pre-assembled in the field before they were erected. Because of their large broadside area, they were difficult to land in the 20-mph wind.

A second pair of haunch girders,

(Concluded on next page, col. 3)

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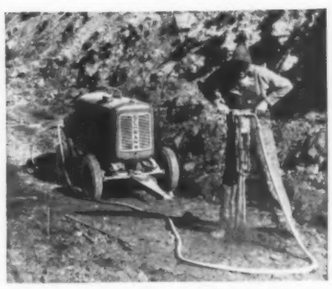

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125 skidded unit can be placed in any position on truck, an advantage not possible with a power take-off assembly.

SCHRAMM *Pneumatractor*

equipped with Back Hoe and Front End Loader, recommended for operating a complete assortment of construction tools.

SCHRAMM *Unistage*

125 4-wheel trailer type operating 55# drill for drilling holes in the bottom of cut for dynamite blasting.

the *Pneumapower* engine driven compressor is a compact package with a decided weight advantage. Skidded, this outfit can be placed in any position on a truck, leaving plenty of space for equipment and maintenance crews. Also available for two wheel mounting. *A Schramm exclusive!*

the *Pneumatractor* provides a complete mobile supply of air, 125 c.f.m., for operating a wide variety of construction tools with the additional capacity to PUSH . . . PULL . . . and POWER a varied assortment of auxiliary units. *A Schramm Exclusive!*

the *Unistage* with the Pneumapower and Pneumatractor represent simplified compressor design that eliminates two-staging and intercoolers, has fewer parts, two gaskets under pressure instead of thirty. Pneumastat control is a feature that provides fuel savings up to 50%. *A Schramm exclusive!*

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"SPEED-MASTER" KETTLE

Saves up to 50% in fuel and time in melting asphalt, tar, pitch, bituminous compounds. The only kettle with flat surfaced heating tubes that provide greater heating surface. Heats and melts as much as 2 ordinary kettles. Has "Flash-Proof" Flues. Trailer models up to 230 gal. size. Can be furnished to burn kerosene or L.P. gas, and with hand or power spray attachment and barrel hoist.

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Or, if you prefer, here's the old reliable Hauck kettle with improved kerosene torch burner mounted outside the kettle. Sizes to 165 gal., on tires or steel wheels.

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(Continued from preceding page)

each weighing 188 tons, was erected about a week later. A pair of closing girders, 138 feet long, was erected later to complete the 10,000 tons of steelwork for the bridge.

To allow for future widening of the span to 30 feet, the bridge is supported by 28 massive piers which rest on an extra-wide foundation. Eventually, the structure will have two 30-foot lanes separated by a 5-foot center mall. The 4,400-foot-long span, set for completion in July by the New Jersey Highway Authority, is the largest structure on the parkway. (See "Parkway Bridge Matches Parallel Span", C. & E., March, 1953, pg. 52.)

George P. Adair, Bethlehem's manager of erection for the New York district, was in charge of steelwork. Assisting him were John McGonigle, resident engineer, and M. L. Carpenter, superintendent.

THE END

Tractor-Shovel Booklet For Public Officials

■ A booklet containing illustrations and data describing some ways in which Payloader tractor-shovels are being used by cities, states, counties, and townships is now available. The literature is directed at public officials in charge of the construction and maintenance of roads, streets, utilities, and parks.

Digging, stockpiling, truck-loading, grading, backfilling, spreading, carrying, snow-fighting, and similar earth-moving and material-handling operations are included in the discussion. On-the-job action views cover all models of Payloaders. Specifications of all six sizes are tabulated, and many useful attachments are shown.

To obtain this literature write to The Frank G. Hough Co., 762 Seventh St., Libertyville, Ill., and request Form No. 263, or use the Request Card at page 18. Circle No. 477.

Water Coolers Feature Drip-Proof Spigot

■ A new vacuum-sealed no-drip spigot for its water coolers has just been announced by the Bettis Corp., 320 S. 66th St., Houston, Texas.

The Igloo water coolers are made of corrugated galvanized steel in 2, 3, 5, 10, and 15-gallon sizes. Standard models have air-space insulation

on the top, bottom, and sides. The heavy-duty models feature a special insulation that keeps water cool longer.

The new spigot is chrome-plated and replaceable. The no-drip feature consists of a positive seal which prevents air from leaking into the chamber between the valve seat and the outlet. The seal is a tight rubber diaphragm which replaces the felt washer ordinarily used to pack off the stem of a spigot.

For further information write to the company, or use the Request Card at page 18. Circle No. 478.

DOTMAR Curb & Gutter PAVER

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Sault Ste. Marie, Ontario

7 Men and a Dotmar Do in 3 Days What Formerly Required 14 Men and A Week

THE fast growing city of Sault Ste. Marie has cut costs and speeded paving of integral curbs and gutters with a Dotmar Speedmaster. They readily pave 2,000 to 4,000 ft. per day—the Dotmar paves 5 to 10 ft. per minute. Only two forms are required. Concrete is conserved. Finished job is more uniform. The Dotmar can be readily adapted to pave sidewalks. New tamping attachment available. Many municipalities and contractors are profiting with a Dotmar. Send for Catalog 53.

Dotmar INDUSTRIES Inc.

519 HANSELMAN BUILDING, KALAMAZOO, MICHIGAN

The Micro Switch electric counting device for truck mixers includes this sealed precision switch.

Revolution Counter For Transit Mixers

■ An electric counting device for use on transit-mix concrete trucks is announced by Micro Switch, Freeport, Ill. The Micro Switch device, located on the dashboard, keeps count of the revolutions of the mixing drum.

The device comes as a package unit, Packet No. 14PA1, which consists of a precision-sealed snap-action switch, a connecting and sealing device, and a Veeder-Root electric counter for use with either 6 or 12-volt dc circuits. The switch is mounted on the outside of the truck frame, next to the mixing drum, so that it is actuated once every time the drum makes a complete revolution. The switch in turn actuates the counter on the dashboard.

For further information write to the company, or use the Request Card at page 18. Circle No. 479.

"How to operate excavation equipment"

New book just published covers proper operation and control of all types of equipment including shovels, tractors, graders, rollers and other machinery.

This book saves time and money in training new personnel, and provides handy tips which mean less down time.

Circle number 500 on the bound-in Red Request Card for more details on "How to operate excavation equipment", plus handy order form.

Contractors and Engineers magazine of modern construction
470 Fourth Avenue, New York 16, N. Y.

Portable Circular Saw For Cold-Metal Cutting

■ A portable cold-metal circular saw that cuts pipe and flats and rounds of cast iron, steel, malleable iron, and nonferrous metals is offered by the Alina Corp., 401 Broadway, New York 13, N. Y. The Baier saw is offered in electrically driven models of 2 and 3⅛-inch cutting capacities, and in air-driven models with capacities of 2 and 3¼ inches. Larger diameters may be cut by rotating the saw around the work piece. Blades available are 7 inches and 10 inches in diameter.

The saw has a casing of light aluminum alloy. The electric model is powered by a Universal ac-dc motor for 220 or 110 volts, and other voltages are available. The power train is through a steel worm gear and wheel drive operating in an oil bath. Air consumption of the pneumatic model is 14 to 46 cubic feet per minute.

The Baier cold-metal circular saw for cutting pipe and flats and rounds in the field.

Special stock rests convert torque into feed, relieving the operator of torsional and weight loads. A set of three stock rests is offered with each saw for straight and mitre cuts. By replacing the normal stock rests with a special slitting rest, the saw may be used for cutting steel and iron sheet up to ¼ inch thick and nonferrous sheet up to ¾ inch thick, as well as Bakelite and similar materials.

For further information write to the company, or use the Request Card at page 18. Circle No. 426.

Hyatt Bearings News

Executive promotions in the Hyatt Bearings Division of General Motors Corp. have been announced.

They include appointment of Martin A. Moore as manager of the Clark Township plant and Edward S. Clymer as manager of the Harrison plant. Leo V. Farrell succeeds Mr. Clymer as general production manager. C. Russell Todd has been named general purchasing agent to succeed Mr. Farrell.

DOMOR Elevating Grader with 22-foot conveyor heap-loads 8-10 yard tandem axle truck in 66 seconds. Depth of cut — 24 inches.

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C. A. Powley, Peoria, Illinois contractor, using the DOMOR Elevating Grader to move the lion's share of 180,000 yards of topsoil dressing for a 3½ mile levee along the Illinois River.

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DOMOR® ELEVATING GRADERS ROAD WIDENERS SNOW BLOWERS
ULRICH PRODUCTS CORPORATION ROANOKE, ILLINOIS

Ulrich Products CORPORATION
ROANOKE, ILLINOIS

Aluminum Ladder Line

■ Aluminum ladders, trestles, platforms, scaffold planks, stages, and A-jacks are illustrated in literature from the Louisville Ladder Co., 1101 W. Oak St., Louisville 10, Ky. Specifications are given for heavy-duty straight ladders in lengths from 6 to 24 feet. These ladders are made with fabricated side rails 3 x 1⅜ inches in size and with 1¼-inch-diameter rungs. They weigh 2 pounds per foot. Two-section and three-section extensions, to 48 feet and to 70 feet respectively, are also described.

Stepladders are also listed in 4 to 20-foot lengths. The steps on these are formed by placing two aluminum ladder rungs side by side.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 480.

The new Acker Model AP all-purpose digger mounted on a small truck.

Booklet on Maintenance Of Earth-Moving Equipment

■ Another in its series of cartoon-style maintenance guides, this one for earth-moving equipment, has been released by the Caterpillar Tractor Co., Peoria, Ill. The booklet takes Jim Jones, the new county road commissioner, through a visit to a typical earth-moving contractor.

The two men pass from one service specialist to another. They tell Mr. Jones how to care for bulldozers, cable and hydraulic controls, pipe layers, rippers, scrapers, shovels, and wagons. Fine points of adjustment and lubrication are explained in more than 90 drawings.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 402.

Portable Earth Borer Digs at Any Angle

■ A new medium-size earth digger is made by Acker Drill Co., Inc., 725 W. Lackawanna Ave., Scranton 3, Pa. The Acker Model AP digger is especially portable and lightweight when mounted on a jeep or light truck and driven from the power takeoff, thus eliminating the need for a separate power plant.

This machine is also available as a skid-mounted unit with a self-contained power plant. This model is a complete assembly for truck mounting and is designed for quick installation or removal from the truck. A special ratchet-actuated slide base allows the digger to be moved in or out 18 inches for rapid positioning.

The new digger is versatile and is recommended for foundation work, soil sampling, and many other hole-digging requirements. With a standard spiral auger head, the digger can bore holes up to 20 inches in diameter and to depths of 10 feet. By using sectional continuous flight augers up to 6 inches in diameter, depths to 75 feet can be reached.

A further important feature is the machine's ability to dig at any angle. A built-in hoist and a sheave wheel at the top of the mast handle loads up to 750 pounds and can be used for hoisting flight augers, driving pipe, and similar operations.

The digger head contains reverse and neutral gearing, eliminating a separate clutch or transmission. Two simple controls operate the hydraulic feed and the raising and lowering of the mast. This simplicity of design reduces maintenance and repairs.

For further information write to the company and request Bulletin No. 40, or use the Request Card at page 18. Circle No. 354.

Do you need information on equipment? Perhaps we can help you. Just return the card that is bound in at page 18.

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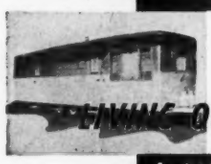

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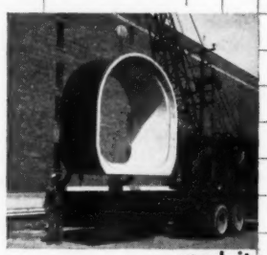
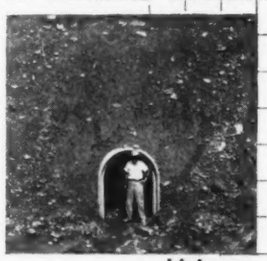
Oldest and largest wheelbarrow maker in America

flatten cost curves with UNIVERSAL Flat-base pipe



conduits



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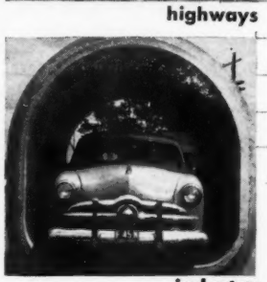

industry

Pre-cast concrete pipe saves up to 30% over built-in-place methods. Easy installation. Up to 100 feet of UNIVERSAL Flat-base pipe can be laid and covered in one day!

Built for heavy duty, low maintenance. Flatten your cost curves . . . specify UNIVERSAL Flat-base concrete pipe. Write . . . we'll tell you more.

THE UNIVERSAL CONCRETE PIPE COMPANY
297 SOUTH HIGH STREET
COLUMBUS 15, OHIO
A subsidiary of the American-Marietta Co.

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Line of Tandem Axles Features New Model

■ A new model tandem axle with a load capacity of 32,000 pounds on the rear tires at the ground is now in production at the Eaton Mfg. Co., 739 E. 140th St., Cleveland 10, Ohio. The new size bridges the gap between present 28,000 and 36,000-pound models and meets the legal maximum in the 37 states which comprise about 90 per cent of the total truck market.

An outstanding feature of the new Eaton Model 32M tandem axle is an inter-axle differential. This third differential in the power divider is said to assure equalized power transmission to the driving wheels, even though wheel speeds may vary due to road irregularities or differences in tire diameter.

The company stresses that since these tandem axles are engineered specifically for tandem operation, they are not subject to the abnormal stresses or complicated lubricating problems sometimes encountered when conventional axles are installed in tandem service.

The new Eaton Model 32M axles are designed specifically for tandem operations.

Other Eaton features include a power divider that is an integral part of the forward axle and assures equal distribution of power to both axles.

The tandem axles provide maximum traction at all times on mud, snow, or ice. This is done by means of a positive differential lock, optional on some models, between the forward and rear axles.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 481

There is a GM Diesel Engine Distributor Near You

ALABAMA—Birmingham 1
ARMSTRONG EQUIPMENT CO.

ARIZONA—Phoenix
O'CONNELL BROTHERS, INC.

ARKANSAS—North Little Rock
LEWIS-DIESEL ENGINE CO.

CALIFORNIA—Berkeley 10
WEST COAST ENGINE & EQUIP. CO.
Los Angeles 21
ANDERSON-O'BRIEN CO.

COLORADO—Denver 9
THE COLORADO BUILDERS' SUPPLY CO.
(Equip. Div.)

CONNECTICUT—Hartford
HOLMES-TALCOTT, INC.

FLORIDA—Jacksonville 2, Miami
FLORIDA DIESEL ENGINE SALES

GEORGIA—Atlanta 2
BLALOCK MACHINERY & EQUIPMENT CO.

IDAHO—Boise, Idaho Falls, Twin Falls
SOUTHERN IDAHO EQUIPMENT CO.

ILLINOIS—Bellwood, Rockford, Rock Island
D. D. KENNEDY, INC.
Mt. Carmel
WESTERN SERVICES

INDIANA—Indianapolis 26, Ft. Wayne, Evansville
FLESCH-MILLER TRACTOR CO.

IOWA—Des Moines, Sioux City
STEPHENS-JONES, INC.

KANSAS—Wichita, Great Bend
DIESEL EQUIPMENT CO., INC.

KENTUCKY—Lexington 47, Louisville, Madisonville
BOGIE EQUIPMENT COMPANY

LOUISIANA—Harvey
GEORGE ENGINE CO., INC.
Shreveport, Alexandria
UNITED TOOL CO.

MAINE—Portland 3
EASTERN TRACTOR & EQUIPMENT CO.

MARYLAND—Baltimore 30
McCLUNG-LOGAN EQUIPMENT, INC.

MASSACHUSETTS—Burlington
MORRISSEY BROTHERS TRACTOR CO.

MICHIGAN—Detroit 4, Grand Rapids
THE EARLE EQUIPMENT CO.
Iron River
DROTT TRACTOR CO., INC.

MINNESOTA—St. Paul, Duluth
BORCHERT-INGERSOLL, INC.

MISSISSIPPI—Jackson
TAYLOR MACHINE WORKS

MISSOURI—North Kansas City
K. C. DIESEL POWER COMPANY
St. Louis 3
WESTERN MACHINERY & ENGINE CO.

MONTANA—Billings
SEITZ MACHINERY CO., INC.
Missoula, Kalispell
MOUNTAIN TRACTOR COMPANY

NEBRASKA—Omaha 2
FEHRS TRACTOR & EQUIPMENT CO.

NEVADA—Reno
SIERRA MACHINERY CO., INC.

NEW MEXICO—Albuquerque
THE HARRY CORNELIUS CO.

NEW YORK—Buffalo 12
BROCK TRACTOR COMPANY, INC.
New York 54
GRIFFIN EQUIPMENT CORP.
Syracuse 2
L. B. SMITH, INC.

NORTH CAROLINA—Greensboro
E. F. CRAVEN COMPANY

NORTH DAKOTA—Fargo, Riverdale
SWEENEY BROS. TRACTOR CO.

OHIO—Cleveland 13, Youngstown
GREAT LAKES DIESEL CO.
Columbus
CENTRAL OHIO TRACTOR CO.
Steubenville
RAY C. CALL COMPANY

OKLAHOMA—Oklahoma City
DIESEL POWER COMPANY

OREGON—Portland 9, Eugene
GUNDERSON BROS. ENGINEERING CORP.

PENNSYLVANIA—Philadelphia 31, Lancaster
FRANTZ EQUIPMENT CO.
Pittsburgh 6
HIGHWAY EQUIPMENT CO.
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STANDARD EQUIPMENT CO.

SOUTH CAROLINA—W. Columbia
VAN LOTT, INC.

SOUTH DAKOTA—Sioux Falls, Rapid City
SIOUX ROAD EQUIPMENT, INC.

TENNESSEE—Chattanooga 1, Nashville
NIXON MACHINERY & SUPPLY CO., INC.
Memphis 2
LEWIS-DIESEL ENGINE CO.

TEXAS—Houston
Corpus Christi, Dallas, Lubbock,
Odessa, San Juan
STEWART & STEVENSON SERVICES, INC.
El Paso
EQUIPMENT SUPPLY CO., INC.
Plainview
DIESEL POWER, INC.

UTAH—Salt Lake City 4
CATE EQUIPMENT CO., INC.

VERMONT—Barre
HILL-MARTIN CORPORATION

VIRGINIA—Richmond 22
BEMISS EQUIPMENT CORP.

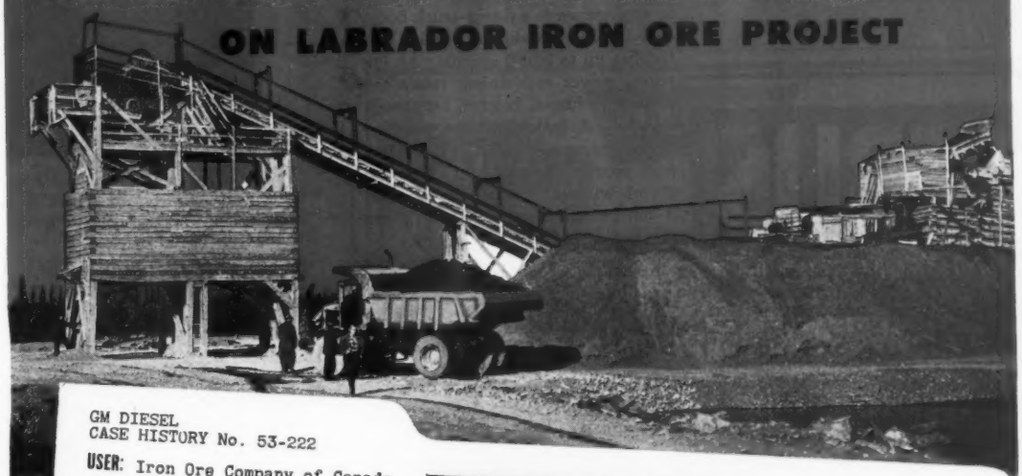
W. VIRGINIA—So. Charleston
So. Fairmont, Bluefield
RAY C. CALL COMPANY

WASHINGTON—Seattle 9
EVANS ENGINE & EQUIPMENT CO., INC.
Seattle 4, Anchorage, Fairbanks
YUKON EQUIPMENT CO., INC. (ALASKA)
Spokane
MODERN MACHINERY CO., INC.

WISCONSIN—Milwaukee 8, Rice Lake
DROTT TRACTOR CO., INC.

WYOMING—Casper
THE COLORADO BUILDERS' SUPPLY CO.
(Equip. Div.)

More than 200 GM Diesel Engines
ON LABRADOR IRON ORE PROJECT

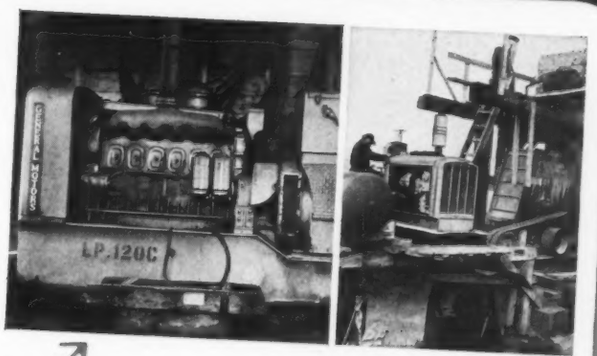


GM DIESEL
CASE HISTORY No. 53-222

USER: Iron Ore Company of Canada

INSTALLATION: GM 6-71 powering conveyors and washer. Another GM 6-71 drives Holland hammer mill. Crusher supplies material for Menihek Dam project, 300 miles above base camp. Two of more than 200 GM Diesels used by I.O.C. and contractors in a wide variety of equipment.

PERFORMANCE: Crusher produces up to 500 yards per day, depending upon truck availability. Crushing 12" stone to 1" to 5" sizes; fines used as sand. GM Diesel used previously for lighting at base camp had run 18,000 hours without any downtime.



—and this one worked 18,000 hours without overhaul

Pushing a railroad 360 miles through wilderness to tap rich iron deposits on the remote Quebec-Labrador border, the Iron Ore Company of Canada and contractors building the road, dams and terminal facilities depend upon General Motors 2-cycle Diesel engines for more different kinds of work than any other engine.

Among the many good reasons is GM Diesel's dependable 2-cycle operation which means more power from a smaller, more compact engine. Smoother, quicker-acting faster-starting power that corresponds to increased loads and gets work done faster at lower cost.

Also, in isolated operations like this—where fuel and all supplies had to be flown in—lighter weight and interchangeability of GM Diesel parts insure higher availability and cut costs. Most moving parts are identical for all Series 71 engines—2 to 24 cylinders—so parts cost less and inventory requirements are lower. Users need never worry about replacements or service, for GM Diesel engines and parts are sold through a world-wide organization of distributors and dealers. The one near you will welcome your inquiry on any power problem.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.

It pays to STANDARDIZE on

. . . available in more than 750 models of equipment built by over 150 manufacturers

GM GENERAL MOTORS DIESEL POWER

The Travel Batcher is being loaded by a front-end loader and will weigh-batch the material and transfer it to the truck mixer.

Wheel-Mounted Batcher Designed to Follow Job

■ A self-powered portable concrete batcher designed to load truck mixers is made by the Southeast Ready-Mix Co., 6500 S. Holladay Blvd., Salt Lake City, Utah. The Travel Batcher consists of a hopper similar in appearance to a dump-truck body, and built-in weighing scales for batches up to 20,000 pounds. An integral power mechanism raises the hopper to funnel batches into truck mixers. A feature of the machine is its maneuverability. It is low and narrow enough for highway travel without special permit, and it can be moved quickly from place to place.

The portable unit can be used as a batching plant working from material stockpiled on the job site. Three optional side bins are available to make the unit capable of high production in such work.

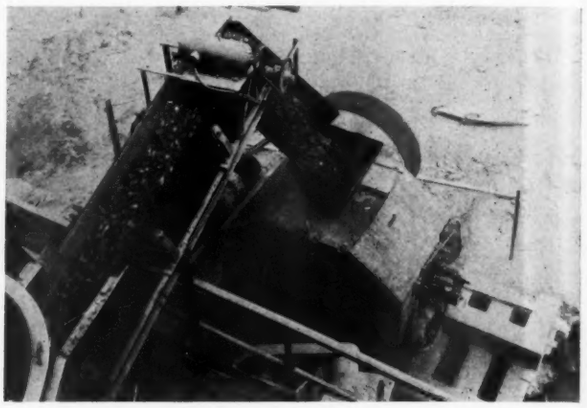
The machine also offers a further operating advantage when standard batching plants are established at the source of the material. It enables the contractor to keep his truck mixers on the job site, while dump trucks transport the batches to the site. The Travel Batcher transfers the loads from the dump trucks to the truck mixers.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 431.

The Red Cross blood bank is still open—so let's roll up our sleeves.

Rock Crusher Features New Roller Design

■ A rock crusher of improved design has been announced by the Waldrip Engineering Co., 11810 Center St., Hollydale, Calif. The manufacturer reports that a new principle for crushing rock has been used in the design of the Latture Roto-Crusher.



The new Latture Roto-Crusher features two specially designed rollers that rotate in opposite directions. This forces the rock through at the peripheral speed of the rollers to increase the crusher's capacity.

The new feature of this crusher is a pair of rotors, one concave and the other convex. Each of these rotors is corrugated axially, with the corrugations constantly spaced around the entire peripheral surface. The rotors are independently driven and move in opposite directions. The chief advantage of this construction is that rock is forced through the rotors at the peripheral speed so that the capacity of the crusher is greater than that of units depending upon gravity flow. Through accurate timing, the corrugations always remain in constant mesh to prevent slippage and to eliminate flat or elongated particles.

Spacing between the rotors can be maintained as desired from ⅜ to 6 inches through the use of a hydraulic system. This system includes an accumulator containing both oil and gas, the oil to assure positive pressure between the rotors, and the gas to allow sufficient compression to permit the passage of tramp iron.

The new crusher is reported to produce ¾-inch-minus material at the rate of 140 tons per hour, with an approximate reduction of 4 to 1.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 362.

Blades and Cutting Edges for Dozers and Scrapers

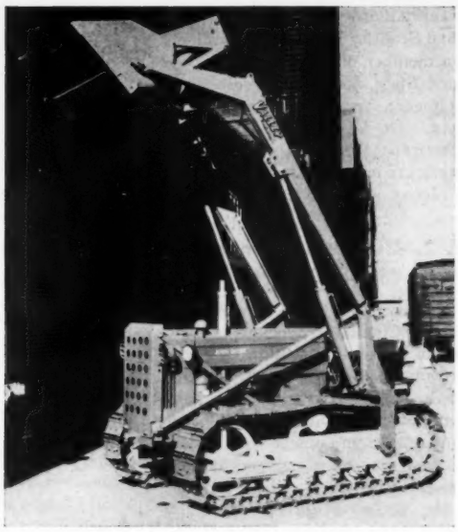
■ A brochure on its blades and cutting edges for highway and road construction and maintenance work is available from The Shunk Mfg. Co., Bucyrus, Ohio.

The line includes snowplow blades, sawtooth blades, and the new Shunk Rhino blades for bulldozers, etc.

This literature may be obtained by writing to the company, or by using the Request Card at page 18. Circle No. 348.

LEBUS
LOAD BINDERS
For Strength
• SAFE
• DEPENDABLE
• ECONOMICAL
GUARANTEED
U. S. PATENT 2,630,609
Handle and linkage gives maximum leverage — clevices, links, and hooks will not deform or bind in roughest service.
LEBUS
LEBUS ROTARY TOOL WORKS, inc.
Phone Plaza 9-2771
P. O. BOX 2352 • LONGVIEW, TEXAS

All Galion All-steel dump bodies are now made of high tensile steel — up to 25% lighter and stronger than ordinary dump body steel.
FOR HYDRAULIC HOISTS AND DUMP BODIES, THE BUY WORD IS GALION
If you want built-in ruggedness, *extra* lifting and *extra* carrying capacity . . . always specify Galion! Galion hydraulic hoists and dump bodies work longer with less maintenance and lower operating costs. With Galion, jobs begin on time, continue steadily without interruption . . . end on schedule.
For big jobs (or for little ones), Galion manufactures a complete line of standard and heavy duty hoists and dump bodies to meet every construction need. And . . . if you need extra heavy duty or special units to fill unusual requirements, Galion will be glad to design and build them for you.
A-7202
GALION MODEL 880 heavy duty hydraulic hoist and Model 12 contractors body easily handle 10½ to 15½ ton loads.
GALION MODEL 700 hydraulic hoist with steel subframe, ideal for loads of 6½ to 8½ tons.
JUST SEE YOUR NEAREST GALION DISTRIBUTOR—TODAY!
THE GALION ALLSTEEL BODY COMPANY • GALION, OHIO



The new Valley hydraulic loader is designed for John Deere crawler tractors.

New Loading Bucket for Crawler Tractor

■ A new combination industrial and farm hydraulic loader for John Deere crawler tractors has been announced by Valley Mfg. Co., Valley, Nebr. The loader is designed to fit 3, 4, or 5-roller models.

The lift capacity is 2,400 pounds, and the standard built-in John Deere pump is used. The loader has double-acting hydraulic cylinders so that the operator has power for either raising or lowering. A construction feature is the specially designed lifting arms of heavy-gage plate steel in a stress-resistant box shape. Nonbreakable steel castings are placed at stress points for reinforcement.

The loader is furnished with a 10.8-cubic-foot utility bucket for shoveling sand, rock, and gravel. The unit can also be equipped with a farm-type manure bucket which includes a dirt plate. Other attachments include a straight or angle dozer blade, a scoop designed to handle light materials and snow, a boom, and made-to-order hydraulic tongs for logging operations.

For further information write to the company, or use the Request Card at page 18. Circle No. 347.

Silicone Water Repellent for Above-Grade Masonry

■ A new technical brochure describing the theory, applications, and benefits of special silicone-resin water-repellent compounds for above-grade exterior masonry is offered by Dewey & Almy Chemical Co., 62 Whittemore Ave., Cambridge 40, Mass. Included in the brochure are comparative ratings of various water repellents, including the company's Daracone, a silicone-resin water repellent.

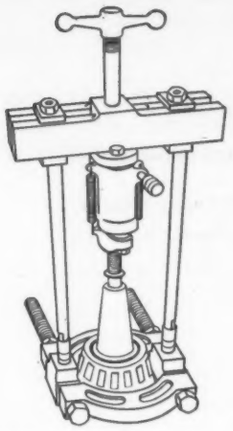
In addition to explaining how silicones work, the brochure shows how such water repellents reduce maintenance costs and preserve structures from water damage, etc.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 384.

Pulling Attachments

■ Two new large-size pulling attachments for use with standard pullers have been introduced by the Owatonna Tool Co., 381 N. Cedar St., Owatonna, Minn. These attachments facilitate the removal and installation of large bearings, gears, pulleys, sheaves, wheels, and couplings on all types of machinery. They are used with the company's 50-ton Power-Twin hydraulic ram in connection with either Grip-o-matic pullers or Push-Pullers.

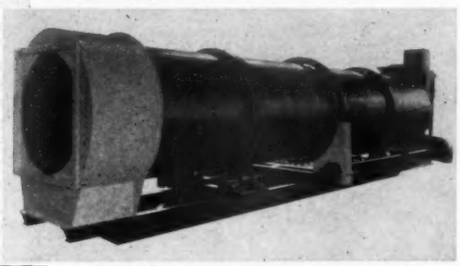
One size has a capacity of 5¾ to 13 inches, while the larger size has a capacity of 6¾ to 16 inches. The pulling tees into which the Push-Puller legs are threaded distribute the load evenly when extreme pressure is used. Thus the danger of distortion is reduced to a minimum.



For further information write to the company, or use the Request Card at page 18. Circle No. 381.

ENGINEERED... to do the job better BUILT... to last longer

● Recognized as the standard of comparison, MADSEN Aggregate Dryers incorporate many outstanding points of superiority. MADSEN Dryers feature a unique cold end cowl design with externally replaceable bottom liners. The interior spiral flights and lifters provide an efficient pattern for heating at minimum fuel costs per ton of material dried. The massive tire, trunnion and bearing assemblies, fully-enclosed gear box and the free-flow stack outlet and feed chute combination... are some of the built-in MADSEN features that mean high daily production and trouble-free performance.



MADSEN AGGREGATE DRYERS

PLUS-VALUES YOU GET IN A MADSEN DRYER

- Fully-enclosed cast steel cut tooth gears for both dryer speed reduction and the cold elevator drive.
- MADSEN-pioneered girth sprocket drive or girth gear for long-lived power application to the shell proper.
- Choice of power... electric motor or engine — low-pressure air-oil, steam-oil or gas fired.
- Available in standard sizes from 32 to 84 inches in diameter and from 10 to 40 feet in length.

MADSEN Equipment that Serves

MADSEN IRON WORKS, INC.
14100 E. ROSECRANS AVE., P. O. BOX 38
LA MIRADA, CALIFORNIA

More for your money!

DAVEY ... TODAY'S BEST COMPRESSOR AND TOOL INVESTMENTS!

Davey Model 210 Super Chief

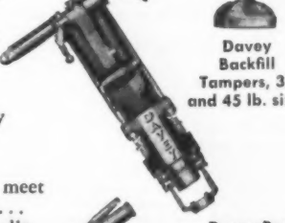
From the standpoint of original investment — and reduced operating costs — *you get more for your money with Daveys.*

DAVEY MULTI-PORT VALVES require less engine power and less fuel . . . never carbon or foul . . . assure constant full volume of air, keep tools operating at top efficiency. And, they're only one of many features of today's fine Davey lightweight, heavy-duty compressors in 60-125-160-210-315-500-600 c.f.m. sizes.

DAVEY AIR TOOLS are designed to meet today's needs! They're streamlined . . . perfectly balanced . . . easier to handle . . . hard-hitting with extra high penetrating power. And, because they offer maximum parts interchangeability, they greatly reduce maintenance and repair expense.

For complete details, see your nearest Davey distributor!

Davey Backfill Tampers, 35 and 45 lb. sizes



Davey Rock Drills, 4 sizes 28 to 58 lbs.

Davey Paving Breakers 4 sizes—35 to 90 lbs.

A-9254

DAVEY pioneers of air-cooled air

DAVEY COMPRESSOR CO.
KENT, OHIO

NAMES IN THE NEWS

NSPE Award for 1954 Goes to H. A. Winne

The 1954 award of the National Society of Professional Engineers, made annually for meritorious service to the engineering profession, will be given to Harry A. Winne at the organization's annual meeting next month in Milwaukee, Wis. Mr. Winne, nationally known electrical engineer who recently retired as vice president of General Electric Co., Schenectady, N.Y., will be presented with the award at the society's annual banquet on June 12.

T. Carr Forrest, Jr., president of the society, said Mr. Winne was chosen for the award because of "his extraordinary achievements in the field of invention, design, development, and production".

Most recently, Mr. Winne has been working on atomic energy developments for G-E and the government.

He has also been connected with various governmental advisory groups, including the Scientific Manpower Advisory Board of the National Security Resources Board. He is a member of the NSPE, the New York State Society of Professional Engineers, and the Newcomen Society. He is also a fellow of the American Institute of Electrical Engineers and the American Society of Mechanical Engineers.

N. J. Bituminous Group Elects McGowan President

Members of the New Jersey Bituminous Concrete Association, meeting at the annual session in Washington, D. C., elected Nicholas J. McGowan president of the organization for this year. At the same time, it was announced that William J. Ryan had been engaged as engineering director for the association.

Mr. McGowan, director of promotional activities of the Kingston Trap Rock Co., has been engaged in promotional and engineering activities related to road building since 1926. A leader in highway construction for many years, he began his career as an administrative assistant in the New Jersey State Highway Department more than 35 years ago.

Prior to becoming engineering director for the association, Mr. Ryan was research engineer for the Natural Rubber Bureau of Washington. He was associated with the New Jersey State Highway Department laboratory from 1923 to 1951.

Robert Collins Is Named NRMCA President for 1954

Robert C. Collins of the Warner Co., Philadelphia, Pa., was elected head of the National Ready Mixed Concrete Association at the organization's convention in Chicago.

Elected with Mr. Collins were Louis C. Schilling of I. E. Schilling Co., Miami, Fla., and Robert Mitchell of Consolidated Rock Products Co., Los Angeles, Calif., vice presidents, and John W. Roberts of Southern Materials Co., Inc., Richmond, Va., treasurer.

Dr. Gilbreth First Woman To Receive Science Award

One of the nation's highest science honors was bestowed on a woman for the first time last month when the George Washington Award was presented to Dr. Lillian M. Gilbreth, 75-year-old industrial consulting engineer. The award was made at Chicago by the Western Society of Engineers and the American Societies of Electrical, Mining, Civil, and Mechanical Engineers.

Dr. Gilbreth was cited for "outstanding contribution to engineering and management, and for unselfish devotion to problems of the handicapped" in the presentation of the award, which previously has gone to such outstanding men as Herbert Hoover, Orville Wright, Henry Ford, and Charles F. Kettering.

Distinguished as an author as well as an industrial engineer, Dr. Gilbreth is the real-life mother in "Cheaper by the Dozen", a popular book written by two of her children. Since the death in 1924 of her partner-husband, Dr. Frank B. Gilbreth, she has continued her career as a management consultant in industrial efficiency.

Dr. Gilbreth holds a doctor's degree in engineering from Rutgers University, New Brunswick, N. J. Her home is at Montclair, N. J.

Col. Pearson Is Engineer Of New England Division

This month, Colonel Richard W. Pearson assumes the post of New England Division Engineer at Boston, Mass., for the U. S. Army Corps of Engineers. Colonel Pearson has commanded the 417th Engineer Aviation Brigade in Korea since last April.

During World War II, he served with the First Army in the European Theater of Operations and later was assigned to command the Hanau Engineer Base at Hanau, Germany.

Colonel Pearson succeeds Colonel Leland H. Hewitt, who is retiring

BLAW-KNOX BASE PAVERS

MODEL P-150 LAYS BASE PAVEMENT UP TO 400 TONS PER HOUR

• Base course paving is fast, accurate and economical with this high tonnage producer. You can spread stone, slag, gravel, soil cement or crusher run aggregates to depths up to 20″ and widths up to 16′ in one pass, with no separation of material. There's plenty of traction and power to push your trucks, yet flotation for the softest surfaces. Oscillating action of the V-type screed "knits" material into the voids for accurately level and smooth base courses. Operating costs are low. Hand dressing behind the unit is reduced to the minimum. Blaw-Knox Apsco Base Pavers are available in two models to meet every base pavement requirement. Write for complete details in Bulletins 2457 and 2459.

BLAW-KNOX APSCO ROAD WIDENERS

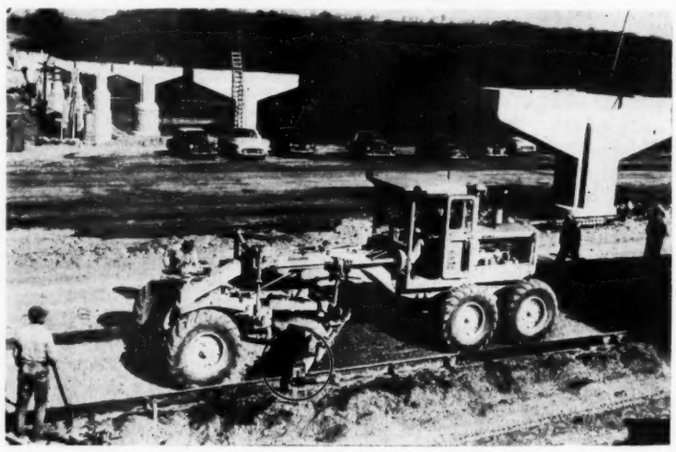
These heavy-duty time and labor saving units handle concrete *without forms*, asphaltic concrete and any kind of aggregate. They spread and finish concrete up to 1½ miles per day . . . build earth shoulders at the rate of 200 tons per hour. Two sizes available to meet your needs. Send for Bulletin 2458.

Ask your BLAW-KNOX DISTRIBUTOR about the *"Complete Packages"* of Concrete Paving and Ready-Mixed Concrete Equipment

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
PITTSBURGH 38, PENNSYLVANIA
Offices in Principal Cities

BLAW-KNOX

For Speed and Economy in Finegrading
***Use* The Roadgrader Gauges**



Motor Graders equipped with Roadgrader Gauges are a familiar sight nowadays on Turnpikes, Thru-Ways, Airports or just on regular paving jobs like the one shown above.

For further information about this wonderful gauge, write to

ROADGRADER GAUGE CORPORATION
D. & Green Streets **Wilmington, Delaware**

Colonel Richard W. Pearson, New England Division Engineer for the U. S. Army Corps of Engineers.
U. S. Army Photo

from active service. A former district engineer at Galveston, Texas, and Seattle, Wash., Colonel Hewitt formerly was engineer for the U. S. Army in the Caribbean. He served in the Southwest Pacific during World War II as air engineer for the Fifth Air Force, and later he was chief engineer with Far East Air Forces.

Gen. Wanamaker Resumes Duties With Turnpike

After an absence of more than two years, General W. W. Wanamaker has returned to the post of executive director of the New Jersey Turnpike Authority. On April 12, he resumed duties which include administration of Authority decisions and policies.

General Wanamaker served as executive director of the organization from 1949 to 1951, during which time the first section of the 118-mile New Jersey Turnpike was completed and opened.

In December of 1951, General Wanamaker left his post with the Turnpike Authority to direct engineering for the development of United States Steel Corp. ore reserves in Venezuela. He also supervised construction of transportation facilities.

New District Engineers For Asphalt Institute

The appointment of district engineers for northeastern and southeastern states has been announced by The Asphalt Institute, New York, N. Y. Robert B. McKeagney has been named to the New England district, with offices at 585 Boylston St., Boston, Mass. Dillard D. Woodson is the new engineer for the states of Alabama, Florida, Georgia, South Carolina, and Tennessee, and will have offices in the Mortgage Guarantee Building, Atlanta, Ga.

Edward M. Howard, formerly New England district engineer for the Institute, has been named district engineer for the states of Arkansas, Illinois, Missouri, and Wisconsin. He will have headquarters in the Leland Office Building, Springfield, Ill.

The territory covering New York State, outside of New York City and Long Island, will be served by Frank H. Gardner. He will have headquarters at the Institute's new branch office at 45 North Lake Ave., Albany.

Dwight Palmer Is Named Highway Commissioner

Dwight R. G. Palmer became New Jersey State Highway Commissioner April 14, following state senate confirmation of his appointment by Governor Robert B. Meyner.

Mr. Palmer, former treasurer of the Democratic National Committee and board chairman and president of the General Cable Corp., will oversee New Jersey's annual $56,000,000 road-construction and maintenance program.

Charles Maguire Dies

The founder of one of the largest engineering firms in the northeast, Charles A. Maguire, died recently at his home in Providence, R. I. He was 66 years old.

Before founding the firm of Charles Maguire Associates in 1938, Mr. Maguire had distinguished himself as a public works official in Rhode Island.

Mr. Maguire was born in Worcester, Mass. He attended Holy Cross College and Massachusetts Institute of Technology.

The automatic exhaust pipe cover. Sizes available to fit from 1" to 6-3/16" exhausts, O. D.

WEATHERCAP provides positive year 'round protection for all engines with vertical exhaust pipes: compressors, road pavers, mixers, crushers, generators, etc. Fully automatic—opens and closes instantly by means of engine exhaust. Seals out rain, snow, dirt, insects . . . prevents flooded pistons, cracked cylinder heads, rusted or warped valves. Quality-built of heavy gauge steel with balanced fins made to uniform specifications conforming to engine exhaust pressures. Low in cost — years of service. Immediate delivery. Write today for full particulars and prices.

ANTHES FORCE OILER CO., AVE. M AT 20TH ST., FT. MADISON, IOWA

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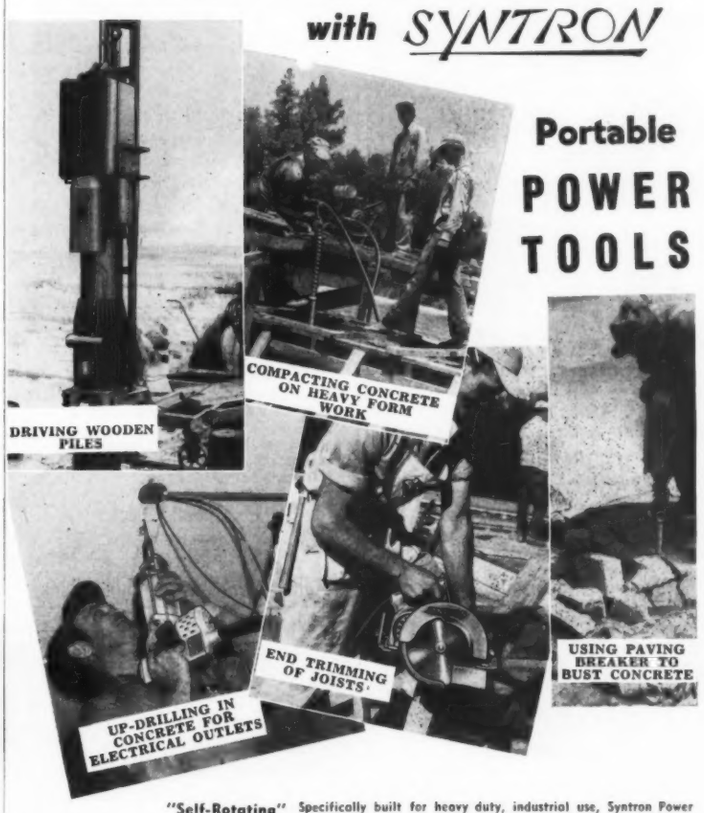

DRIVING WOODEN PILES
COMPACTING CONCRETE ON HEAVY FORM WORK
END TRIMMING OF JOISTS
UP-DRILLING IN CONCRETE FOR ELECTRICAL OUTLETS
USING PAVING BREAKER TO BUST CONCRETE

Specifically built for heavy duty, industrial use, Syntron Power Tools keep job costs down on countless construction and maintenance projects. Designed for continuous operation on the toughest commercial jobs. Rugged, high speed tools that require very little maintenance.

"Self-Rotating" ELECTRIC HAMMER DRILLS

Eliminate slow, laborious hand-turning of drill chuck. Speeds drilling in concrete and masonry—with less effort.

Gasoline Hammer ROCK DRILLS and PAVING BREAKERS

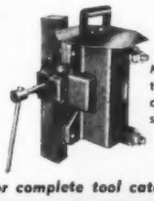
Completely self-contained. Drill — dig — cut — tamp with 2000 powerful blows per minute. Automatic rotation of drill bit.

ELECTRIC SAWS with Dual V-Belt Drive

Fast, easy cutting of wood, concrete block, plaster board, etc.

CONCRETE VIBRATORS

Mass and Form types for uniform compacting and settling concrete.



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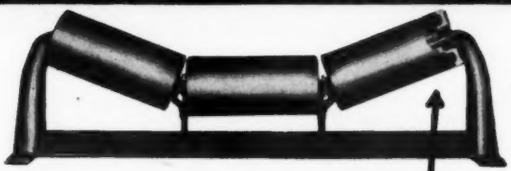
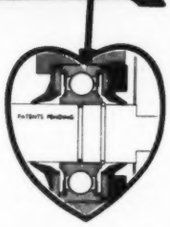
SYNTRON COMPANY
227 Lexington Ave. Homer City, Pa.

BELT CONVEYOR IDLER NEEDS NO RE-LUBRICATION





Cross section of bearing showing 4 seals which keep lubrication in and dirt out.

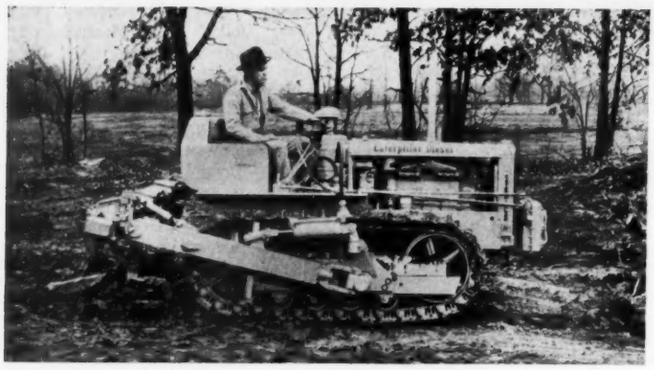
SEALED BEARINGS HEART OF IDLER

The heart of Transall's Tran-Seal Belt Conveyor Idler is its precision ground, heavy duty ball bearing. Each bearing is protected by *4 service-proven* synthetic rubber seals. The bearing is permanently lubricated at the factory and never needs re-lubrication. For details, write TRANSALL, INC., 119 N. 11th St., Birmingham, Alabama.

Sales Representatives in principal cities.

(120-Q)

TRANSALL SECTIONAL BELT CONVEYOR SYSTEMS



The improved Caterpillar Model D2 tractor is shown equipped with heavy-duty chisels.

Crawler Tractor Has Increased HP Rating

■ A heavier and more powerful version of its Model D2 crawler tractor, capable of pushing or pulling nearly 8,000 pounds, is announced by the Caterpillar Tractor Co., Peoria 8, Ill. Drawbar horsepower in the new tractor has been increased from 32 to 35, and belt horsepower is up to 42. Total weight of the machine has been increased approximately 525 pounds.

Contributing to the new machine's greater capacity is the fact that there are 1,460 square inches of steel track on the unit to grip the ground. The tractor's over-all length has been increased 6⅛ inches, and two more track sections have been added.

As a result of the increased length, it is now possible to remove the flywheel clutch without disturbing the engine. The seat has also been moved forward for better access to the rear of the steering-clutch case.

Other improvements in Caterpillar's longer Model D2 include a track carrier roller and heavy-duty fenders, offered as standard equipment, and an under-the-seat tool box. Fuel-tank capacity has been stepped up from 20 to 26 gallons. The tractor still uses No. 2 furnace oil.

For further information write to the company, or use the Request Card at page 18. Circle No. 434.

Concrete Pressure Pipe For Sewer Construction

■ A new booklet that describes how their concrete pressure pipe meets the requirements for certain types of sewer-pipe lines is offered by the Price Brothers Co., 1932 E. Monument Ave., Dayton, Ohio. With high structural strength and tight joints as advantages, the Price pressure sewer pipe is particularly recommended for sewer force mains, sewer lines that must be free from infiltration, and subaqueous sewer lines.

The catalog lists available sizes of concrete pressure sewer pipe, nonpressure concrete sewer pipe with rubber gaskets, and regular concrete sewer pipe.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 452.

Versatile Excavator Has Varied Attachments

■ A mailing piece is available on the multipurpose Gradall excavating unit made by the Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio. The versatility of the machine is emphasized as it is shown excavating, trenching, ditching, sloping, and backfilling.

Attachments for the excavator include a single-tooth ripper, an 8-foot scraper blade, a 36-inch rehandling bucket, a 72-inch formed ditch-digging bucket, a 60-inch ditching bucket, and a 47-inch pavement-removal bucket. Five trenching and excavating buckets offered range in width from 15 to 36 inches, with capacities from ⅐ to ½ yard. A 60-inch bucket is available for snow-removal purposes.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 482.

Fabricating Bench Is Aid In Making Trussed Rafters

■ A new and practical fabricating bench layout with which all four basic members of Teco trussed rafters may be cut and grooved has been developed by the Timber Engineering Co., Department FB, 1319 18th St., N. W., Washington 6, D. C. It is stated that with this bench the work can be done with precision for accurate assembly.

The trussed rafters, which may be delivered to the job ready for erection or produced on the job site with the suggested new rig, are used in the construction of homes, one-story wood school buildings, recreation and community structures, and commercial and industrial buildings. Scale drawings of the fabricating bench layout and copies of a new booklet on how to build wood-frame Teco trussed rafters are available.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 369.

THIS *is the*

CLAMP...

That is easiest to attach; provides strong, full-circumference grip on the hose; and can be used again and again . . . always with same sure holding power.

"KING"
SINGLE *and* DOUBLE BOLT
HOSE CLAMPS

Made of tough, durable malleable iron . . . completely rustproofed. Full-width tongue between reinforced bolt lugs prevents pinching and damaging hose. Bolts are carefully machined and threaded for maximum ease of application.

Single bolt style, sizes ⅞" to 5¼"; double bolt style, sizes 3½" to 17¼".

Double Bolt

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for year 'round patching

The O'Hadi Patcher heats both hole and mix at the same time.
Heats the hole with contained radiant heat . . . NOT a direct flame.
An all weather Patcher.
FAST — ECONOMICAL — PERMANENT
Satisfaction guaranteed.
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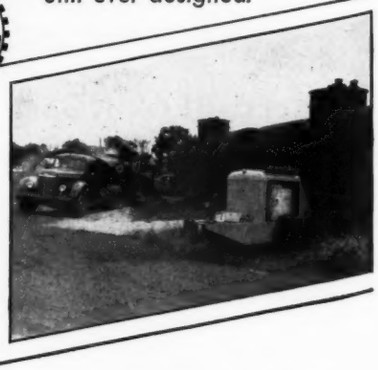
BUHL MACHINE WKS., Buhl, Idaho

"TANKAR" STEAM HEATER

MODEL No. 115

Equipment with BUILT-IN ENGINEERING LITTLEFORD

. . . fastest steam producing unit ever designed.



Just hook up this Littleford Model 115 "Tankar" Steam Heater to one or two tank cars of Bituminous materials and in 1/3 less time it can be unloaded. This fully automatic "Tankar" Heater produces 200 lbs. of steam in 2 minutes from a cold start. No waiting—no wasted time. Then too, the "Tankar" Heater produces steam only when steam is needed, saves fuel. The Model 115 Tankar is 85% efficient. Here's a complete "package of steam" engineered to give Highway Departments and Contractors a Low Cost money saving unit.

LB LITTLEFORD
BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE - 1900

LITTLEFORD BROS., INC.,
485 E. PEARL ST., CINCINNATI 2, OHIO

Model 115 "Tankar" Steam Heater is small, compact, highly portable and easily handled by one man. Can also be used to clean equipment, garage floors, thawing, sterilizing, etc. Automatic controls make it the last word in safety. Take a further look at this amazing Littleford Unit. Write for Bulletin 21.

The Master Midget power trowel may be carried by one man and is recommended for float-finishing concrete in tight spots.

Portable Power Trowel for Concrete Finishing

■ A gasoline-powered portable tool that floats and finishes concrete is announced by the Master Vibrator Co., 461 Stanley Ave., Dayton 1, Ohio. The Master Midget power trowel is used for float-finishing concrete floors, and is particularly recommended by the manufacturer for small jobs such as basements and sidewalks. This portable trowel can be carried and operated by one man and is useful in tight spots where finishing is ordinarily done by hand.

A 1.6-hp Briggs & Stratton engine drives three swept-back blades in a circular pattern to produce a hand-trowel sweep-finish. The blades adjust for floating, sweat, smooth, or hard-trowel finishes. The machine weighs less than 70 pounds and measures 24 inches in diameter.

For further information write to the company, or use the Request Card at page 18. Circle No. 455.

New Book Treats Farm Drainage Engineering

A comprehensive text designed to meet the demand for an up-to-date treatment of the subject of farm drainage has been published by McGraw Hill Book Co., Inc. The authors are Harry Burgess Roe, professor emeritus at the University of Minnesota, and Quincy Claude Ayres, professor of agricultural engineering at Iowa State College.

The book, "Engineering for Agricultural Drainage", is intended as a text or reference work for students, farmers, engineers, and others interested in farm drainage theory and practice. It presents the latest information on scientific drainage design, major types of drains and drainage problems, open-ditch construction and maintenance, and cost of drainage. The book is generously illustrated with diagrams, maps, and pictures, and contains more than 80 tables on various phases of the subject.

The volume is said to bring together an abundance of recent information on agricultural drainage heretofore available only in separate pamphlets, bulletins, and unpublished documents.

The book is priced at $7.50 and may be ordered from the publisher at 330 W. 42nd St., New York 36.

send for this catalog describing acker's new all-purpose digger

Send the coupon today for your copy of our new catalog showing the wide range of application as well as the many exclusive features that make the *Acker All-Purpose Digger* the most versatile and useful you can buy!

TWO MODELS TO CHOOSE FROM — Jeep mounting with compact, power take-off or skid-mounted with self contained power plant for truck mounting.

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10 Yard Single Axle

With An OMAHA STANDARD CENTER DUMP SEMI - TRAILER

14 Yard and Over Tandem Axle for Single or Tandem Axle Trucks.

Built to job specifications, single or tandem axles. Conforms with state highway laws in capacities from 10 to 20 yards and over. Light-weight, high tensile steel construction. All bracing external; load area clear. Mechanically operated hopper doors standard. Air-actuated trips, or hydraulic controls for both opening and closing also available. All trip mechanisms metered to control flow of materials. Hopper doors built to stand bucket loading. Because contractor's equipment must be kept running, these trailers are designed to be repaired locally, eliminating delays due to waiting for parts. Any mechanic can service or repair. Write now for full information and address of your nearest distributor.

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Dept. 2, 2401 W. Broadway
COUNCIL BLUFFS, IOWA

Lock 'Em Together!

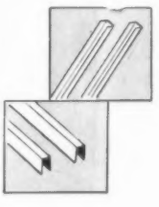
Eliminate the Danger of Tilting and Spalling

with **KAPCO**

TONGUE and GROOVE JOINT

Pre-formed Kapco Tongue and Groove Joint provides the keyed action essential to maximum load transmission. This non-extruding joint is extensively used as either center strip or contraction joint and is especially suitable for the "lane-at-a-time" method of construction for highways, airports and industrial floors. Rigid control of the quality of asphalt and other ingredients provides added rigidity, ease of handling and absolute uniformity.

Kapco Tongue and Groove comes neatly packed in steel strapped cartons which provide easy transportation and storage as well as protection on the job site. The joint is constructed of ⅛" asphalt mastic board in standard lengths of 10'1". Widths vary to accommodate standard practice of using joint which is ½" narrower than the depth of the concrete slab. Standard punch is 2'6" on centers for ½" dowel bars and 24" on centers for stakes.



Stake pins for Kapco Tongue and Groove are ⅜" channel type, 15" long, 300 pins to a bag. 12 gauge installing cap plate is available in standard 5 or 10' lengths.

Order separately or in combination with other Kapco products which include famous Kapco Asphalt, Fibre or Fiberglas Expansion Joint, Kapco Rubber Asphalt Joint Sealer, Kapco Concrete Curing Compound, etc., etc., etc.

For your convenience why not order *all* of your expansion joints, joint sealers and curing compounds from *one* source!

WE GUARANTEE PROMPT SERVICE!

KAP

KEYSTONE ASPHALT PRODUCTS COMPANY

DIVISION OF AMERICAN-MARIETTA COMPANY

General Offices: American-Marietta Building, 101 East Ontario Street, Chicago 11, Illinois

Wire-Reinforced Surface

A new bulletin describing and illustrating the use of wire fabric as reinforcing in bituminous resurfacing has been published by the American Road Builders' Association. The booklet reports in detail the construction of a test installation in Washington, D. C., for the purpose of study and observation.

The booklet, called "Welded Wire Fabric Reinforcement in Bituminous Resurfacing", is Technical Bulletin No. 204, and can be ordered from the American Road Builders' Association, World Center Building, Washington 6, D. C. ARBA members are entitled to a free copy; otherwise, the booklet sells for 50 cents.

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A DIVISION OF WARD'S NAME PLATES

Rotary Cutting Machine for Roadside Mowing

■ A new rotary cutter, suitable for a wide range of cutting jobs from roadside mowing to clearing underbrush, has been added to the Dearborn equipment line, according to the Tractor & Implement Division, Ford Motor Co., Birmingham, Mich. The machine cuts and shreds weeds and brush so that grasses are not smothered. A removable deflector shield is mounted under the blade hood to insure even distribution of cut material. By removing this deflector, material may be windrowed behind the machine. The cutter is lifted and lowered by the Ford tractor hydraulic control.

Two 5-foot blades, mounted on a central carrier, are driven by the tractor power-takeoff through a universal drive. A slip clutch protects both implement and tractor from excessive loads and eliminates the need for shear pins.

The Dearborn rotary cutter.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 378.

Literature on Leveling Instruments

■ A line of leveling instruments is described in literature from the Kern Surveying Instrument Division, Paul Reinhart Co., Inc., 66 Beaver St., New York 4, N. Y. The booklet gives general observations on Kern NK levels and lists specifications. Other sections are devoted to a description of the instruments, details on tripods and rods, directions for setting up the instruments, and testing and adjusting procedures.

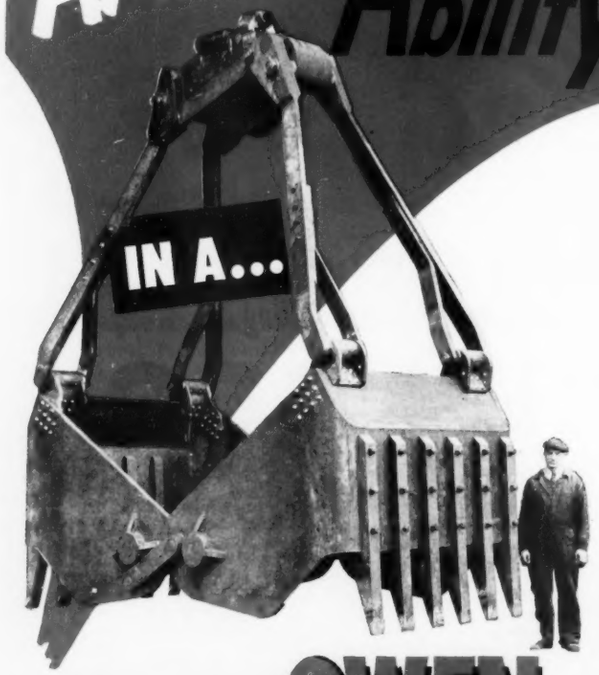
The line includes two models. The NK 2 level is suitable for technical levelings, length levelings, and tacheometrical surveys in flat country.

The Model NK 3 leveling instrument is similar in principle and design to the Model NK 2 but is larger and heavier.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 459.

AMPLIFIED Ability

IN A...



● 13 TON OWEN

The stresses and strains to which especially large machines are subjected are more than proportionally greater than machines of conventional size. Proper designing challenges the knowledge and skill of the engineer.

An interesting example of skillful designing and sound construction is this 5 Cu. Yd. Owen Bucket built to handle dredging of large blasted rock.

In general design and principle of operation it is typically Owen. But it has two main shafts to cover an unusually large area when open, teeth almost as large as a man and increased power sufficient to fully utilize its tremendous capacity.

If you have an uncommon need you can depend upon Owen to build a special bucket that will render the same satisfactory service you have long enjoyed from standard Owen Buckets.

A MOUTHFUL AT EVERY BITE

THE OWEN BUCKET CO.

6030 Breakwater Ave., Cleveland 2, Ohio

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MECO Surface Seal

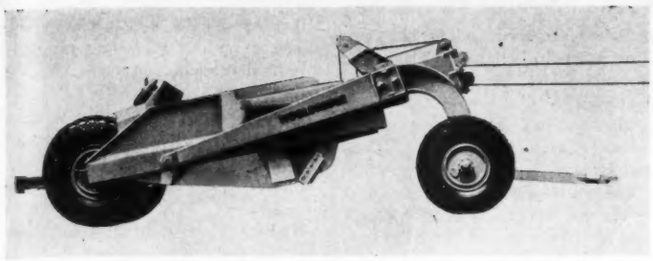
Protects Blacktop Pavements!

(Tested successfully against jet fuels and fire)

You can make better blacktop installations with MECO Surface-Seal. Contractors know that MECO seals, renews and tightens the surface, as well as beautifying the pavement. It is particularly useful on areas which take a lot of punishment. Gas stations, parking lots, airports and private driveways use it because it is weather and solvent proof.

Economical and easy to use, MECO Surface-Seal will give you a better job on your next blacktop contract. Makes old driveways new—makes new jobs last longer. Write for folder and names of satisfied users. Distributors in all major cities.

Maintenance Engineering Co. 16 West Johnson Street Philadelphia 44, Pa.



The Model OS-80, one of four new Wooldridge scrapers, has a heaped capacity of 10.5 cubic yards.

Tractor-Drawn Scrapers in Four New Models

■ A line of four new open-bowl tractor-drawn scrapers that was recently introduced by the Wooldridge Mfg. Co., Sunnyvale, Calif., provides a payload range from 10.5 to 25.0 cubic yards heaped capacity. Low center of gravity, high ground clearance, wide apron opening, application of the company's "boiling-bowl" loading principle, and positive ejection are among design features reported.

Completely new are the Wooldridge Model OS-80 with capacities of 10.5 cubic yards heaped and 8.4 struck and the OS-90 of 15.0 cubic yards heaped capacity and 12.2 struck. Model OS-152, first introduced early in 1953, is now rated at 18.0 cubic yards heaped and 15.1 struck. The fourth and largest new model is OS-200 with a heaped capacity of 25.0 cubic yards and a struck rating of 20.0 cubic yards.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 396.

Simple Wale Support for Concrete Forms

Held by two nails, this simple waler support from the Conver Steel & Wire Corp. secures wall forms and reportedly holds the weight of workmen standing on walers.

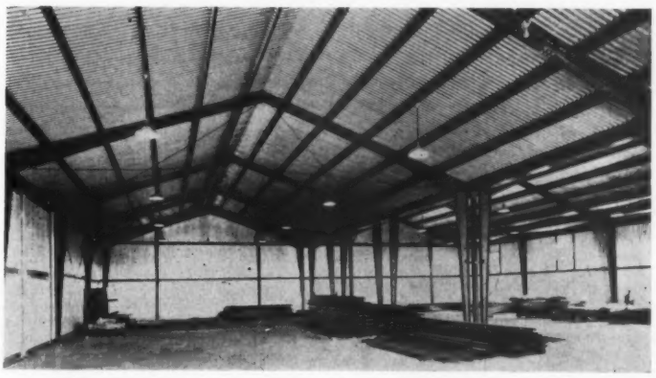
■ A simple wale support is made by Conver Steel & Wire Corp., 600 E. 132nd St., New York 54, N. Y. The form accessory fits neatly over any 2 x 4 upright stud and is held securely to it with two nails. In this position, it serves as a shelf for horizontal wales and prevents downward thrust on the tie rods that pass through the wall forms.

These wale supports may be placed as near or as far apart as wall thickness and other conditions dictate. According to the manufacturer, they will support the weight of workmen who stand on the wales, and they will not permit any distortion or injury to wedges, spreaders, or tie rods.

For further information write to the company, or use the Request Card at page 18. Circle No. 387.

Rigid-Frame Buildings With 40-Foot Spans

■ A new clear-span rigid-frame building has been introduced by United Steel Fabricators, Inc., Wooster, Ohio. An all-steel structure, this building provides a 40-foot clear span without central columns, as well as 14-foot clearance to the eaves.



This all-steel structure recently introduced by United Steel Fabricators, provides a building with a 40-foot clear span.

The new product adapts to multiple building structures by joining at the eaves. Any length may be obtained by combining 20-foot bay lengths. A patented USF sheet attachment method is said to simplify and speed erection and to eliminate holes through the sheets. Accurate fabrication insures no drilling, riveting, or welding in the field.

A special insulation clip has been developed to allow attachment of 24-inch hard-board insulation for roofing or side walls.

The sides and roof are covered with 24-gage galvanized box-corrugated sheets. Corrugations are 1 inch deep and 4 inches on center. Doors with a 20 x 14-foot clear opening height may be located at any side bay or centered in the end of the building. These doors are split with each half opening separately.

For further information write to the company, or use the Request Card at page 18. Circle No. 373.

DAY IN and DAY OUT Your Unconditionally Guaranteed

Davis Loader

WILL DO MORE JOBS BETTER THAN ANY OTHER LOADER

There's no time out for this work horse. Convenient attachments give it year 'round useability. Exclusive features such as 12-minute attachment, box frame construction oil filter, adjustable arms that keep bucket in correct position with ground and others make it your best buy.

SHOVELS AND LOADS Leaves, snow, dirt, and trash are easily cleared and loaded with either material or utility bucket.

DOZES Dozer has 62" blade. Skid shoe extends full length. Permits hydraulic control of bite.

DRIVES POSTS Powerful post driver can be operated by one man. Drives 10' high to 5' below ground.

BUSTS CONCRETE, ETC. The handy concrete buster is made by simply attaching a chisel plate to post driver hammer. Has multitude of uses.

LIFTS BULKY MATERIAL Heavy-duty crane is invaluable for lifting all types of bulky material.

SEND THIS COUPON FOR COMPLETE FACTS

Dept. B

Please send me literature on the Davis Loader to fit a _____ model tractor.

NAME _____

ADDRESS _____

CITY _____ STATE _____

MID-WESTERN INDUSTRIES, INC. 1009 S. WEST ST., WICHITA, KAN.

"Th' 'McBlockism' platform - A BETTER BLOCK FOR EVERY PURPOSE!"

DIAMOND PATTERN

EXTRA HEAVY

CONSTRUCTION BLOCKS

McKISSICK

McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

THE NEW WORTHINGTON Model F tractor, shown here with seven-gang push-type mowers attached, is recommended for roadside maintenance. The tractor, manufactured by the Worthington Mower Co., Stroudsburg, Pa., has front-wheel drive and rear-wheel steering. With cutting units mounted in front, the grass is mowed ahead of the power-unit wheels. This eliminates streaking and gives the operator a better view of his work. For information write to the company, or use the Request Card at page 18. Circle No. 443.

Sound-Powered Telephones

■ Sound-powered telephones are illustrated in literature from the United States Instrument Corp., Summit, N. J. The brochure describes handset and headset instruments as well as complete stations and systems.

The sound-powered principle eliminates the use of any outside power source. The voice of the user supplies all the power to operate the USI telephones. The voice causes fluctuations in the magnetic circuit of the transmitter which create an alternating current. This current is transmitted to the receiver where sound waves are created which reproduce the speaker's voice.

According to the literature, speech is transmitted clearly and distinctly without any distortion from static noises usually associated with battery-type telephones. The manufacturer claims satisfactory transmission up to 30 miles or more under normal conditions, using No. 22 AWG wire.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 433.

Hobbs Expands Production

After 25 years as a distributor for hydraulic dump bodies, the Hobbs Mfg. Co., Fort Worth, Texas, has entered the dump-body manufacturing field. The line of heavy-duty steel dump bodies, already in production at the Fort Worth plant, will be added to the company's line of truck trailers.

While similar to the bodies which Hobbs has been selling, the new equipment is lower priced.

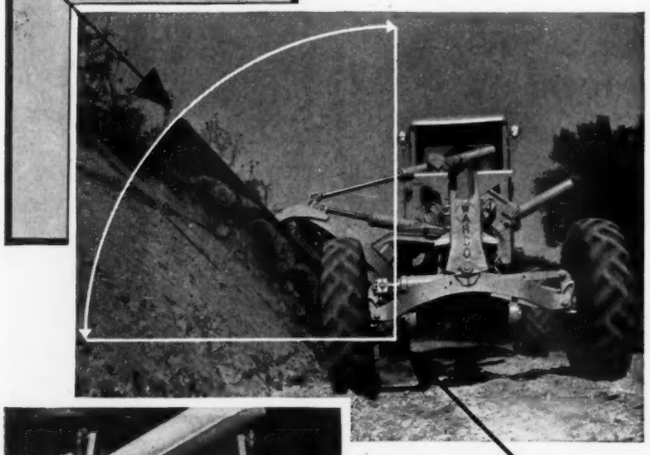
WARCO®
up to a 90° angle on either side...

COMPLETE HYDRAULIC CONTROL of every working position is yours . . . entirely governed from the cab . . . but it's yours *only* with a WARCO!

ONLY WITH A WARCO can the operator hydraulically attain a high bank-sloping angle up to 90° on either side . . . secure extreme side reach for level grading . . . arrive at any blade position required for ditching . . . all this without ever leaving the cab.

ONLY WITH A WARCO can the operator hydraulically maneuver the blade from 90° on one side to 90° on the other . . . or rotate the blade 180° for a back-up pass . . . without manual adjustment of linkages.

ONLY WITH A WARCO is such complete hydraulic blade control possible . . . time-saving flexibility that speeds work, cuts down-time, and lessens operator fatigue.



This unique WARCO rotating saddle makes it easy to secure even extreme blade positions . . . hydraulically changes the cross-shift arm position to give the blade added reach.*

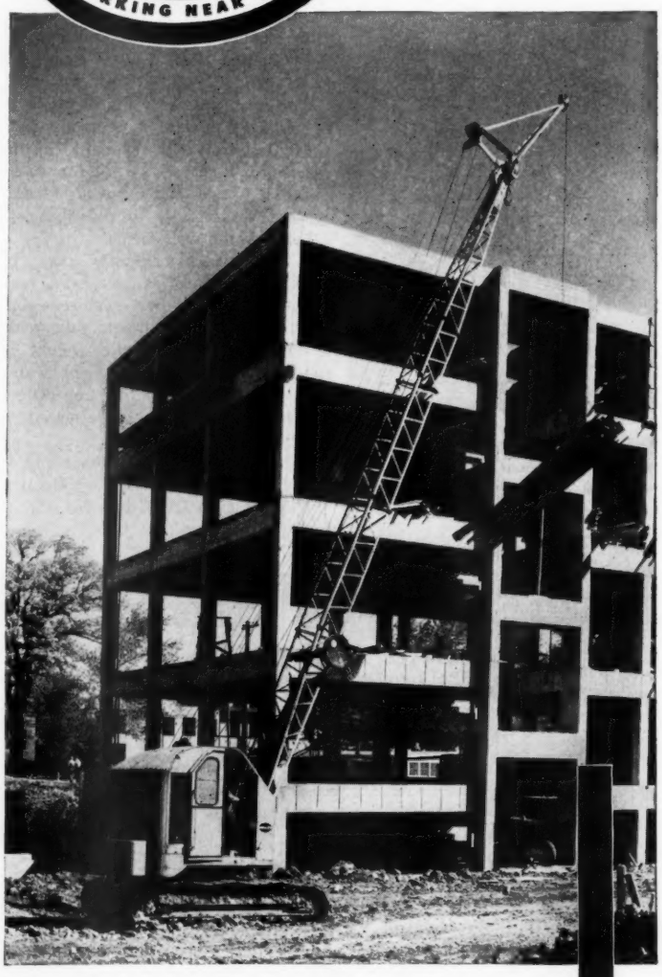
*U. S. Pat. No. 2,655,743

W. A. RIDDELL CORPORATION
Bucyrus, Ohio U.S.A.
Builders of WARCO Motor Graders and HERCULES Road Rollers

WARCO® MOTOR GRADERS
MODEL 4D-100 HEAVY DUTY 100 HP
MODEL 4D-85 MEDIUM DUTY 85 HP

THERE'S AN INSLEY WORKING NEAR YOU

ON A CONSTRUCTION PROJECT



The Insley Line includes excavators and cranes, 5 to 30 ton capacity—rubber or crawler mounted — gasoline, diesel or electric powered. There's an Insley working near you on a construction project.

INSLEY MANUFACTURING CORP. • INDIANAPOLIS
wholly owned subsidiary
THE MAXI CORPORATION, LOS ANGELES

Among earth drills manufactured by Mobile Drilling, Inc., is the Model B-52 with a 68-inch stroke. The drill shown here is mounted on a 1-ton Ford Model F-500 truck and is powered by a Ford plant.

Portable Earth Drills

■ An extensive line of earth drills is made by Mobile Drilling, Inc., 960 N. Pennsylvania St., Indianapolis 4, Ind. The company now manufactures a complete line of drills ranging from a small unit which operates from the power takeoff of a jeep to a large rotary unit which the company claims is the only rotary drill on the market that uses a hydraulic motor for its rotary turntable. This unit is the Model 200 Reich mobile drill. It has a 12-foot stroke. The drill can core drill through most of the known minerals including hard stone, to depths of 500 feet. The unit is operated by one man and can be mounted on a 1½ or 2-ton truck and operated by the vehicle's power takeoff.

The company emphasizes that it uses hydraulic feed in all of its drilling equipment to obtain a positive even down pressure. Most of the drills convert quickly from auger drilling to core drilling. Typical uses of the units include their application in highway construction to determine the substructure of the soil and to locate depth of bridge foundations, barrow beds, sand and gravel beds, and aggregate beds.

The company has recently developed a 10-inch auger which, in conjunction with an expanding head, is used by contractors for foundation work where it is necessary to enlarge the bottom of the hole for a large firm base of concrete. The drill is also used for installing wellpoints where it is necessary to lower the water level of excavations for large buildings, storm sewers, and dams.

For further information write to the company, or use the Request Card at page 18. Circle No. 435.

New B. F. Goodrich Office

B. F. Goodrich Tire & Equipment Division last month opened combined warehouse and office facilities at 1345 N. 22nd Ave., Phoenix, Ariz., to serve as a distribution center for the Arizona market.

The new distribution point, stocking all types and sizes of B. F. Goodrich tires and tubes, will also serve as headquarters for tire servicing and adjustment.

Portable Hand Light Has Long-Life Battery

■ A new portable hand light with a nickel-cadmium battery that has a life expectancy rated at 15 to 20 years or 1,000 cycles of charges and discharges is offered by the Dual-Lite Co., 186 Front St., Bridgeport 6, Conn. Each discharge is rated for eight hours of continuous lighting—representing 8,000 lighting hours—as contrasted to a 7½-volt dry battery with an average discharge of 6 to 8 hours. During discharge, the battery is completely sealed, and it does not require additions of water during use.

Immune to freezing, the hand light may be used or left in sub-zero temperatures without being damaged. The battery weighs 7 ounces, and it is rechargeable by any ordinary automobile battery charger.

The Dual-Lite hand-held lighting equipment.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 393.

Three Hundred and Fifty Days in a Man-Made Dust Storm

We create this dust storm in a sealed chamber. Within it, Brunson instruments are bombarded by fine pumice dust borne by a constant gale of wind. The instruments are rotated continuously during the test.

Even after 'round-the-clock exposure to such extreme conditions for eleven and a half months, the accuracy and operability of Brunson instruments is unimpaired.

What better proof can there be that Brunson dustproof, ball bearing construction offers the answer to your three big headaches with surveying instruments—binding caused by dirt, inaccuracy caused by wear between moving parts, and costly maintenance to overcome the effects of dirt and wear?

In Brunson instruments, dirt is sealed out, the lubricant sealed in, and wear is practically eliminated by the smooth ball bearing action in the spindle and telescope axis. They maintain lasting accuracy—without costly routine repair . . . loss of time on the job through malfunctioning . . . or adjustment to compensate for errors.

They cost no more—offer *lots* more. Write today. You'll be glad you did!

BRUNSON
The New Standard of Excellence

DISTRIBUTED EXCLUSIVELY BY
BRUNING
Everything for the Engineer and Draftsman

CHARLES BRUNING COMPANY, INC. • 4700 MONTROSE AVENUE • CHICAGO 41, ILLINOIS

The NEW SAMSON
DIGGER — SHOVEL — CRANE — LOADER

The new Samson is faster digging, easier loading, and higher lifting. It is hydraulically operated, truck mounted, engine driven, and operated by one man.

Samson digs deeper (12'), lifts higher (12'), and provides 180° full vision digging radius. You get more value for less in Samson.

Samson is ideal for small contracting jobs that ordinarily tie up larger equipment. Write for illustrated circular describing the many improvements in this new Samson.

AVERY TRACTOR COMPANY, Hancock, Mass.

Marion Fills Posts

Heading District 116 for Marion Power Shovel Co., Marion, Ohio, is L. G. Currie. He will cover sections of Indiana, Illinois, and Kentucky. Mr. Currie was formerly service and erection engineer for Marion clutch-type machines.

Clarence S. Jarvis has been assigned as a sales engineer to the Birmingham, Ala., district office of the company. The district covers the states of Louisiana, Florida, Alabama, Georgia, Mississippi, North Carolina, South Carolina, and Tennesee, as well as part of Arkansas.

CAMPBELL DETACHABLE CABS

assure • FULL PROTECTION • FULL VISIBILITY • FULL PRODUCTION on your tractor

With a CAMPBELL DETACHABLE CAB on your tractor, your operator can work in any kind of weather—no work stoppage. All cabs have special, light-weight safety glass used throughout.

You will find a detachable cab available for many types of tractor models. Cabs are handled by your industrial tractor dealer.

For complete information on cabs to fill your needs write:

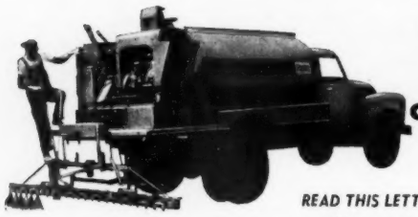
Campbell Detachable Cab Co.
WAUCONDA ILLINOIS

To say that we are well pleased with our

ROSCO DISTRIBUTOR

would be stating it mildly!

Ed M. Knott, Asst. City Eng. Muscatine, Iowa



"One of the Best Pieces of City-Owned Equipment"

- **Uniform application through exclusive Pressure Metering**
- **Use any length of Spraybar without changing pressure**
- **Accurate, non-clogging, no-streak Vee-Jet Nozzles**

Ask your dealer, or write Rosco for the full story of the Bituminous Distributor with "P.M."—the Pressure Metering Method.

READ THIS LETTER **from Ed M. Knott of Muscatine:**

"Early in the summer of 1951 the City Council of Muscatine purchased a Rosco 1000 gallon capacity Distributor and mounted it on a 1½ ton truck. To say that we are well pleased with our Rosco Distributor would be stating it mildly.

"We started our extensive road program last year and our Rosco was in constant use every day it was possible to work. We seal-coated 150 blocks of City Streets and in addition to this, constructed 36 blocks of road mix asphalt, besides oiling nearly 100 blocks of City Streets.

"During all this time we had only one minor breakdown on our Rosco which was taken care of in less than 2 hours time by our own mechanics.

"All of this work was done directly under my supervision and I feel well qualified to praise our Rosco as one of the best pieces of equipment owned by the City of Muscatine and we own nearly $150,000 worth of street construction equipment of all makes.

"This year we are planning another heavy schedule of street improvements and when we start in a few weeks I entertain no fears as to what our Rosco will and can do for us."

ROSCO-PACTOR

Latest design compaction roller provides positive lap between front and rear tread. 9 and 13 wheel models.

ROSCO MINNEAPOLIS

3118 SNELLING AVENUE • MINNEAPOLIS 6, MINNESOTA

DISTRIBUTORS • MAINTAINERS • BROOMS
SUPPLY TANKS • TAR KETTLES • STREET FLUSHERS

This elevator attachment was developed by the Hancock Mfg. Co., Lubbock, Texas, for Allis-Chalmers motor grader Models AD-30 and AD-40, and the two preceding Models AD-3 and AD-4.

Loading Elevator for Motor Graders

■ A newly designed elevator attachment for side-casting or loading trucks is now available for the Allis-Chalmers 78-brake-hp AD-30 and 104-brake-hp AD-40 motor graders. It can also be mounted on the two preceding models, the AD-3 and AD-4. The capacity of the elevator is up to 1,200 yards per hour, depending on the soil conditions. Developed by the Hancock Mfg. Co., Lubbock, Texas, the unit is sold through Allis-Chalmers dealers.

The length of the conveyor is 19 feet, with a 3-foot extension available as an extra. The conveyor can be shortened to 16 feet by removing a 3-foot length. For transit, the hinged conveyor folds at the center to a vertical position.

Controls for operating the plow beam and raising and lowering the conveyor at the drive-roller end, tail-roller end, and the hinged center are near the operator.

An exclusive two-way spiral cleaner carries dirt out both sides. The cleaner is driven by the conveyor belt to eliminate transmission problems. A V-type cleaner keeps dirt from getting under the belt. Carrier bearings are sealed double ball-bearing rollers.

For further information write to the company, or use the Request Card at page 18. Circle No. 483.

practical pointers...

ON CHOOSING THE RIGHT INSTRUMENT FOR YOUR JOB

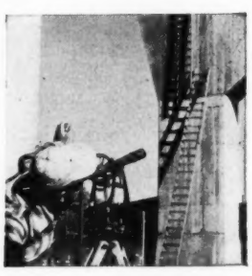
Now you can choose from *two different lines* of Berger Instruments, the type that best fits your day-to-day surveying needs—from the simplest home and road building job to the most exacting first-order surveying projects. For now, Berger makes both moderate-priced Builders and Contractors Instruments and its world-famous Engineers' Transits, Levels, Alidades, Theodolites and Astronomical Instruments.

Whatever your surveying need, there's a Berger to do it Better—like those illustrated here. *Count on quick delivery—thanks to enlarged capacity.*

Write today for descriptive literature on Berger Instruments.

For Roads...Home Building...and similar construction... laying out and measuring horizontal and vertical angles, leveling, measuring differences in elevation, setting building lines and batter boards, lining up engine beds, plumbing walls and columns, use the sturdily built, moderately priced Berger Convertible Transit-Level. 12-inch erecting-internal focusing hard bronze telescope. Rack and pinion adjustment. 24 power coated optics. Steel spindle. Horizontal and vertical vernier readings to 5 min. Dust-protected axis bearings, leveling, tangent and clamp screws. Mahogany transit case. *Write for details of Berger 12" Dumpy Level and Builders' and Farmers' Service Transit-Level.*

For Exacting Assignments...Highways, Dams, Bridges... the Berger Engineers' Transit. Horizontal circle has double opposite verniers reading to minutes, 30 seconds or 20 seconds; verniers are offset to line of sight and provided with reflectors. Protected vertical circle has double vernier. Graduations on Sterling Silver. Erecting-internal focusing telescope. Smooth-acting leveling and tangent screws; level vials readily visible. Large bearing areas on centers and clamps. "R" type equipped with compass, yoke standard and wye bearings.



C. L. BERGER & SONS, INC.
37 WILLIAMS STREET, BOSTON 19, MASSACHUSETTS

Write for a FREE copy of "ACCURACY IN ACTION"

THE BEST IN SIGHT IS

BERGER

ENGINEERING AND SURVEYING INSTRUMENTS...SINCE 1871

The Joy Challenger blasthole drill.

New Blasthole Drill Has Large Capacity

■ What is reported to be the largest hammer drill yet designed is the heart of the new Joy Challenger blasthole drill. The Challenger will drill 4½-inch-diameter holes to depths of 50 feet or more in any type of formation, including hard igneous or metamorphic rocks. A 5¼-inch hammer-type drill, mounted on a 26-foot feed to give 20-foot steel changes, furnishes drilling power for this capacity.

The blasthole drill is available with a choice of three different mountings. The Model TWM-2 is mounted on a three-wheeled chassis and is self-propelled by a tractor power unit. It has a hydraulic pump, for raising and lowering the mast, and an integral dust collector. The TWM-2A, also a three-wheeled chassis unit, is self-propelled by two reversible piston-type air motors and equipped with an air-powered hydraulic system. The TWM-3 consists of the drill and feed, with the necessary brackets for mounting on the drill operator's own crawler-mounted tractor or truck.

The Challenger drill uses 2-inch-round sectional steel with a ¾-inch air hole. The drill has a feature which permits simultaneous drilling and blowing. Other advantages include force-feed lubrication, a replaceable cylinder liner, and replaceable brushings at all wearing areas.

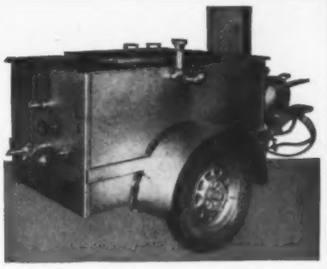
For further information write to the Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh, Pa., or use the Request Card at page 18. Circle No. 421.

Atlas Powder Scholarships

Atlas Powder Co., Wilmington, Del., has set up eight $1,000 college scholarships for 1954-55 college seniors who are majoring in chemistry, physics, or any branch of engineering.

The program, proposed to 40 colleges and universities, will be administered by the Atlas committee on scholarships. Successful candidates will also have an opportunity to work during the summer at one of Atlas' plants or laboratories.

White Oil-Jacketed Kettles for Heating Elastic Joint Filler



Joint-filling compounds containing rubber for elasticity, must have indirect heat application. They melt at 375° and must not exceed 425°. White Model F-10 kettles maintain this temperature accurately by oil jacket which transfers heat to the compound. White kerosene burners are safe, dependable, easily controlled. Hand operated agitator. Insulated housing. Other kettles for paving maintenance have FIRE-PROOF tops. Hand or engine sprayers. Several sizes.

Write for Circular

White Mfg. Co.

Elkhart 9 Indiana

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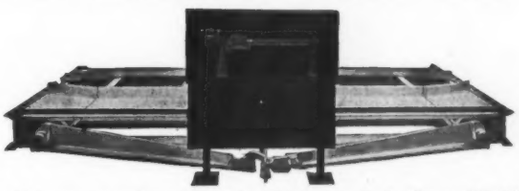
WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacities: 15-18-20-30 tons.

Write us for name of your nearest distributor.

WINSLOW SCALE COMPANY
P. O. Box 1198 Terre Haute, Indiana

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470 Fourth Avenue, New York 16, N. Y.

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Plymouth 35-ton gas locomotive, std. ga.
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Whirley gantry cranes; 75-ton derricks.
Telsmith 26" steel gyratory crusher, 25A.
Dredges, diesel, steam, elec., 20", 18", 14".
Cranes, draglines, shovels, 1½ to 18 yds.
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Diesel-elec. generators (5); marine diesels.
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ALL SIZES AND TYPES
ANY QUANTITY
OFFER US YOUR SURPLUS NEW PIPE
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To sell our famous Formula No. 640 colorless masonry sealer, silicone water repellent, concrete hardener, floor mastic, admix for topping floors always cold and wet curing compound, rubber enamel, roof coatings, gilsonite paints, floor wax containing duPont's Ludox. Thirty products. Contact building owners and managers, contractors, etc. Commission. Territory. Name this magazine. Write Haynes Products Co., 4007 Farnam St., Omaha 3, Nebr.

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SAVE 25% DECALS
10 DAY DELIVERY
MIRACLE DECAL CO.

Full Load...Accurate Dumping...Easy to Operate

The perfect weight distribution of Omaha Dragline Buckets gives a full load with every cast. The entire load is dumped quickly and accurately. Perfect balance makes it easier for operator to spot dump. For over 42 years experienced contractors have relied on Omaha for every Dragline need. Write for complete catalog giving specifications of 4 available types.

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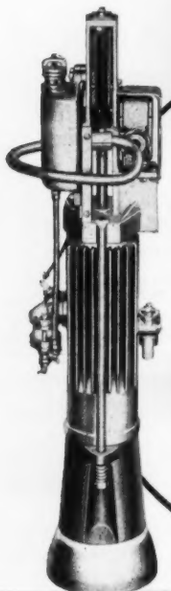

For the LOW BID on any job, figure your costs with BARCO

BARCO *Gasoline* RAMMER

BETTER BUILDING CONSTRUCTION! This job called for high degree compaction. The Barco Rammer did it at the rate of 1 to 1½ square yards per minute with 12" to 20" lifts and handled from 160 to 240 cu. yds. per 8 hour day.

CUTS TRENCH COSTS! Using lifts up to 24", this Rammer finished backfill in 18" trench at a rate of 360 to 600 feet per hour for quick completion of job and no cost for additional backfill.

SOIL COMPACTION is here to stay! *Specified Compaction* is now accepted practice on all modern construction projects. The BARCO RAMMER gives you specified compaction on these jobs at very little extra cost. Time after time, it has been proven that no other type of equipment can match BARCO PERFORMANCE:

- Better work! Easy to meet specifications calling for 95% to 97.5% (modified Proctor) compaction.
- Ideal for work in restricted areas: inside buildings, close to walls, culverts, and abutments—in trenches, ditches.
- Faster compaction! 20 to 30 cu. yds. per hour—day in and day out.
- One man operation! Completely self contained; no auxiliaries needed.
- Low operating cost. Low initial cost.
- SAFE! Simple to operate. Operators like Barco Rammers.

ASK FOR A DEMONSTRATION—See for yourself—ask for our nearest distributor to give you a demonstration. Catalog No. 621 on request.

BARCO *Manufacturing Co.*
518F Hough St., Barrington, Ill.
A Chicago Suburb

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VERTICAL PRESTRESSING OF CONCRETE walls for a concrete water tank is done with a Re-Mo-Trol hydraulic jack. Six wires, which are secured in the bottom of the wall, are prestressed at one time.

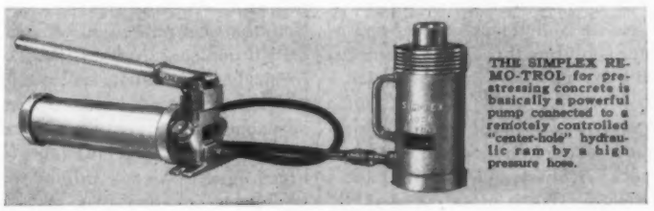
Remote-Controlled Hydraulic Puller Perfected for Prestressing Concrete

Construction Men Cite Simplex Unit for Fast, Easy Use

Tensioning cable, wires or rods for concrete prestressing is being done easily and quickly with Simplex hydraulic "center-hole" pullers, a number of construction men report. Because the unit is actually made up of two parts, a remotely controlled ram and a pump, the puller is more easily handled than conventional hydraulic jacks, they explain. The pump unit can be located nearby where it is most convenient for the operator. Many users install a pressure gauge, available as an accessory, between the pump and the puller to check the amount of prestressing applied. This Simplex Re-Mo-Trol puller is also useful on construction jobs as a powerful jack for lifting equipment and building sections, for aligning heavy beams, etc., and for testing the load bearing ability of the soil. Available in 7 models with capacities from 10 to 100 tons, it works in tight spots and enables workmen to stay at a safe distance while lifting, pulling or pushing.

Made by the world's largest manufacturer of industrial jacks, the Re-Mo-Trol is only one of many Simplex jacks that are useful in the construction industry. Others include the famous Jenny self-contained "center-hole" puller, the No. 310A Emergency Jack which lifts 15 tons on the cap, on the toe, on a cap shoe or at intermediate heights with a chain sling, and standard hydraulic, screw and ratchet lowering jacks. They are all described in General Catalog No. 53. Write for a free copy.

TEMPLETON, KENLY & CO.
2511 Gardner Road • Broadview, Illinois



THE SIMPLEX RE-MO-TROL for prestressing concrete is basically a powerful pump connected to a remotely controlled "center-hole" hydraulic ram by a high pressure hose.

MANUFACTURER MEMOS

Barber-Greene Elects New Slate of Officers

New officers of Barber-Greene Co., Aurora, Ill., for 1954 are headed by H. A. Barber, president. He succeeds W. B. Greene, co-founder of the company, who has been named chairman of the board.

Other new officers include: S. E. Faircloth, vice president-production coordinator; H. E. Herting, vice president-comptroller; W. A. Greene, secretary; F. J. Merrill, assistant secretary and assistant to the president; Urban Hipp, assistant treasurer and assistant to the president; E. H. Holt, vice president-director of sales; J. D. Turner, vice president-director of publicity and promotion; R. C. Heacock, vice president-director of manufacturing and engineering. J. M. Spence was re-elected treasurer.

At right is W. B. Greene, retiring president of Barber-Greene Co., who has been named chairman of the board. At the extreme right is H. A. Barber, the new president of the company.

Mr. Barber started with the company in 1933 as a field service engineer and later was appointed chief engineer. He has been vice president of the firm since 1937. In addition to serving as president, he will continue to head the advanced-development division.

Mr. Greene, who founded the business with H. H. Barber in 1916, has been president since 1945. As chairman of the board, he will continue to play a vital part in company management.

Clark Equipment News

Seven district representatives have been appointed for the construction machinery division of Clark Equipment Co., Buchanan, Mich. The men named and their respective territories are: O. B. Law, west central district; Nile H. Bartell, eastern district; George T. Japhet, southern district; Frank Reach, Jr., east central district; Clarence E. Zermer, southwest district; Devereux W. Pedley, western district; and Richard W. Lewis, northwest district.

Products of the division include power shovels, cranes, and draglines formerly manufactured by Michigan Power Shovel Co., and a recently introduced line of tractor shovels.

In other appointments, Chester J. Tucker has been named field service manager, while William E. Woodley, Gale H. Stokes, and Cecil L. Starner have been made field service representatives.

A new division for its Ross line of straddle carriers has been established by the company. A. H. Pierce will be manager, and Roger Spencer will be chief engineer.

A 25-minute sound film dealing with applications of the straddle carrier trucks now is available from the Clark Co. Titled "Over-the-Load Materials Handling", the film illustrates uses of the equipment in construction and other industries. The basic design and operation of the machines are also shown.

LeTourneau-Westinghouse Names RR Sales Manager

R. N. Turner has been appointed railroad sales manager for LeTourneau-Westinghouse Co., Peoria, Ill. His headquarters will be in Peoria.

Mr. Turner was formerly in the sales department of Modern Machinery Co., a Le-Tourneau-Westinghouse distributor in Spokane, Wash. During the war, he served as company commander with the Aviation Engineers, assisting in the building of airfields in England, France, Belgium, and Germany.

HARD-FACING TRICKS that pay off with Longer Equipment Life

Life of almost all wearing parts—on tractors, bulldozers, power shovels and other heavy construction equipment can be doubled by Stoody hard-facing. Maximum increases always result when correct procedures are employed.

WHEN REBUILDING WORN DRIVE TUMBLERS

First determine the base metal. Rebuild manganese steel with Stoody Nickel or Moly Manganese. If tumbler is high carbon steel, rebuild with Stoody Build-Up. Bring back to final size with an overlay of Stoody 1027—chosen because of good wear resistance on metal to metal friction and high impact strength. (We're often asked if a hard-faced part won't cause faster wear on the mating element. Answer is no. Because hard-faced parts retain original shape far longer, they mate more perfectly with opposite members, reducing wear on each. Also, since a lower coefficient of friction exists between alloy and steel, life of both parts is actually extended.)

WHERE TO HARD-FACE

Note the wear pattern on your old drive tumblers and hard-face accordingly. Usual points are on tops and pressure faces of lugs; occasionally along tumbler periphery. NOTE: It is essential to keep both faces of lugs aligned on each side of the tumbler to equalize wear. Make a template for the purpose.

SIMPLIFYING THE OPERATION

Faster, easier hard-facing is possible if tumbler is mounted on a jig and rotated for down-hand welding, although tumblers can, if necessary, be touched up while still on the shovel.

This and other hard-facing applications are fully described in the Stoody Hard-Facing Guidebook.

Ask your Stoody Dealer for a copy (see the yellow pages of your phone book) or write direct.

STOODY COMPANY
11936 East Slauson Avenue
Whittier, California

James C. McClure, vice president and general sales manager of the Universal Atlas Cement Co.

Universal Atlas Elects McClure Vice President

The Universal Atlas Cement Co., New York, N. Y., a subsidiary of U. S. Steel Corp., recently elected three executives to higher offices within the organization.

James C. McClure, assistant vice president since 1952, was made vice president and general sales manager. A member of the Ohio Society of Professional Engineers and the American Concrete Institute, he joined the company in 1927 as technical service engineer. In 1935, he was made technical service manager at Pittsburgh. He also served as district sales manager at Albany, N. Y., and sales manager at Dayton, Ohio, before becoming assistant vice president.

The two others elected were Fred T. Wiggins, who was named vice president, commercial; and Henry C. Schmielau, comptroller, who was named to the additional office of vice president. In other changes, Mac H. Hull was appointed assistant to the president and W. Owen Lawrence was made general operating manager.

Two promotions in the sales organization of Universal Atlas Cement Co., New York, N. Y., have been announced. Elmer C. Martin has been named assistant to the vice president of the firm, and Harry T. Swanson has been appointed manager of the company's Atlas White Cement Bureau, succeeding Mr. Martin.

New Lincoln Engineers

Three new application engineers have been assigned by the Lincoln Electric Co., Cleveland, Ohio, to serve industrial users of arc welding equipment. Jack Jaso has been assigned to the Chicago district, Walter Pickway will direct servicing of equipment in the Cincinnati district, and Chester Shira will serve the industry in the Jacksonville, Fla., district.

Waldrip Engineering News

Appointments have been made by the Waldrip Engineering Co., Hollywood, Calif., to fill the posts of chief design engineer and division manager for the organization.

Dr. Joseph Remenyi, the company's new design engineer, is a native of Czechoslovakia and was formerly associated with the Skoda Works in that country and with Rausch Co., Ltd., in Germany. He is a specialist in highly stressed parts for heavy equipment and holds patents on various types of crushers. A member of ASME, he has written extensively for technical journals.

Freeman Gates, the second appointee, is manager of the company's aggregate and mining-machinery division, which is currently introducing the Latture Concave-Convex Roto-Crusher to the rock and gravel trade. He was formerly assistant production manager for Consolidated Rock Products Co., Los Angeles, Calif.

Allison Division Appoints

Supervisor, Commercial Products Service, Transmission Operations, for the Allison Division of General Motors Corp., Indianapolis, Ind., is J. G. Gerrard.

New Davey Appointment

The new southeastern district manager of the Davey Compressor Co., Kent, Ohio, is John W. Peters. Mr. Peters will be in charge of Davey's compressor and air tool sales in Tennessee, Alabama, Mississippi, North and South Carolina, Georgia, and Florida. He will make his headquarters in Wartburg, Tenn.

New Joy Co. Branch

Opening of a new district office in Cleveland, Ohio, has been announced by Joy Mfg. Co., Pittsburgh, Pa., producer of machinery for construction operations. Howard E. Butters is district manager for the new office which covers sections of Ohio, Michigan, and Kentucky. Branch offices are at 2410 Terminal Tower, Cleveland 13, Ohio.

FULL BUCKET...LOAD AFTER LOAD!

This is typical of the load a Cat® HT4 Shovel can handle time after time without strain on machine or operator. Here it's busy moving excess dirt around a newly completed house in Denver, Colorado, for Harry Brannon & Sons, Denver contractors.

Let's listen to Mr. Brannon's comments on the rig: "It's built strong—it will stand up under a beating where others won't. Visibility and control are good—it can cut a grade of 1%. And it pays off—it loaded three trucks to every two of a competitive loader."

That's really laying it on the line. And the HT4 will back it up with all-around performance on *your* job. Name the chore—grading, digging, backfilling, loading—this sturdy, compact rig will deliver money-making production for you. Take loading, for instance. Its full 43 horsepower, delivered at the shovel's cutting edge, enables it to come up with a full bucket even in tough digging. Rugged lift arm construction, a box-section cross-brace tieing the arms together, prevents bucket twisting and excessive wear. Plenty of reach and dumping height get the bucket over the edge of high-sided hauling units. And good visibility and smooth control allow the operator to pick up and dump each load without waste motion.

Ask your Caterpillar Dealer to show you how the versatile HT4 can pay off for you. Remember, he backs it up with prompt service—whenever and wherever needed. He'll be glad to demonstrate on your job!

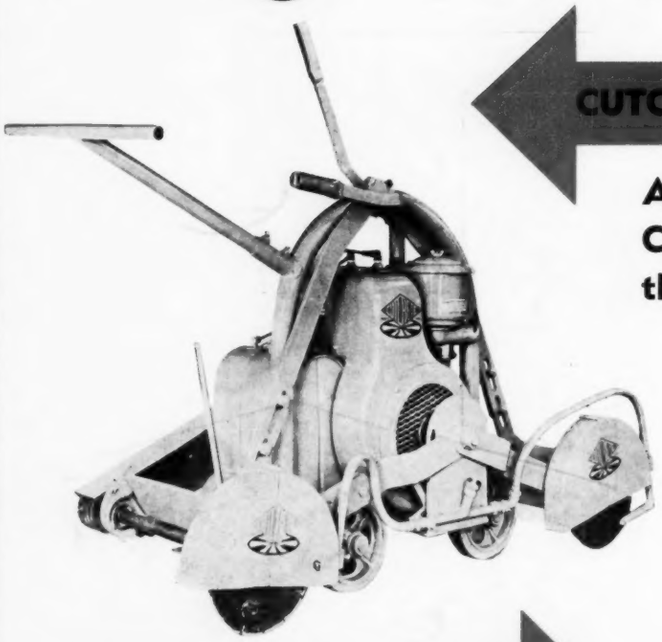
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR®

CUTCRETE

Trail Blade CONCRETE SAWS

BY THE ORIGINATOR OF MOBILE CONCRETE SAWS — HURST LEWIS

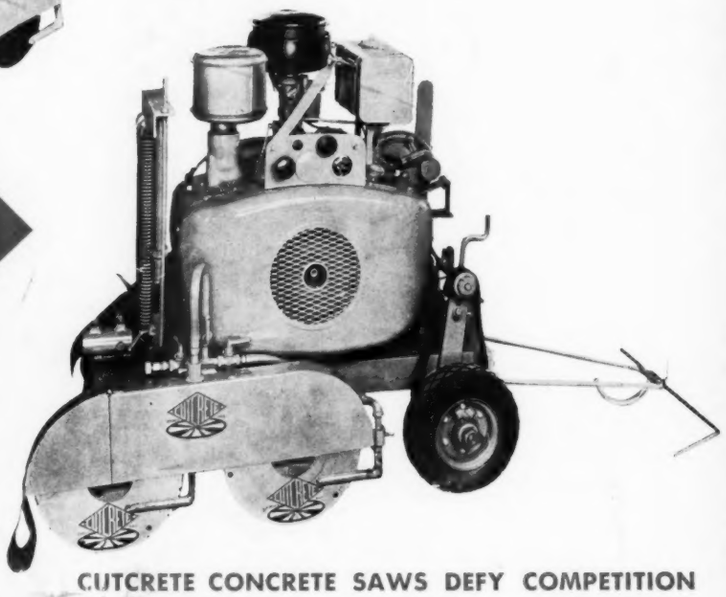


CUTCRETE MODEL J-J-S TRAIL AND LEAD BLADE MACHINE

Announcing a Heavy-Duty CUTCRETE CONCRETE SAW that makes a complete cut on pavement strips and building floors without reversing machine . . . write for complete details

CUTCRETE SUPER S-T-T MODEL TRAIL BLADE SAW

A heavy-duty step-cutting, 26 h.p. engine, self-propelled machine with 12″ blade capacity, 4″ depth cutting at twice speed of single blade machine . . .

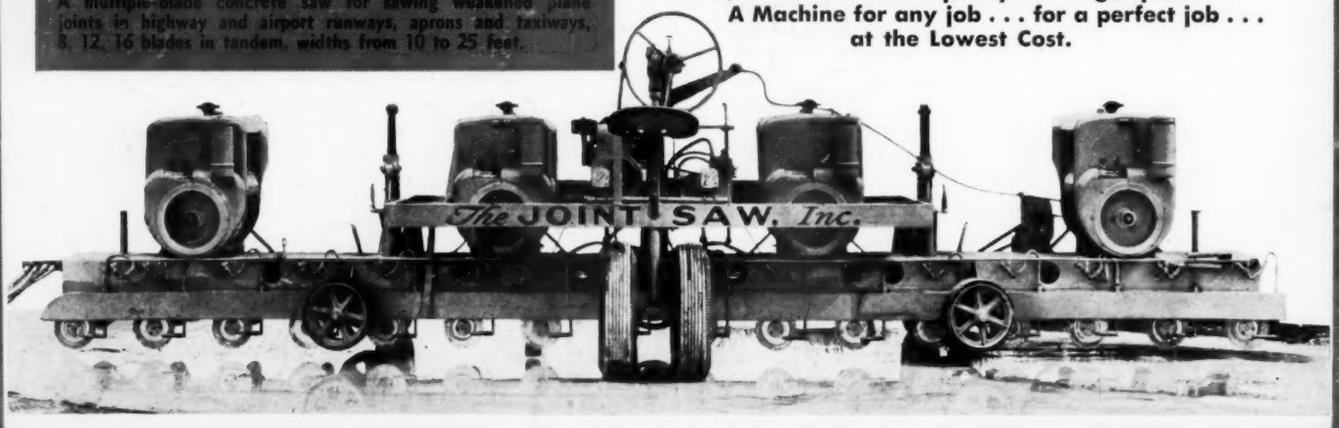


CUTCRETE CONCRETE SAWS DEFY COMPETITION

8 Models from which to choose . . . Dual-Blade Machines for smaller jobs, Multiple-Blade Cutcrete Joint Saw 8, 12 or 16-blade capacity for larger jobs . . . A Machine for any job . . . for a perfect job . . . at the Lowest Cost.

THE JOINT SAW

A multiple-blade concrete saw for sawing weakened plane joints in highway and airport runways, aprons and taxiways, 8, 12, 16 blades in tandem, widths from 10 to 25 feet.



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